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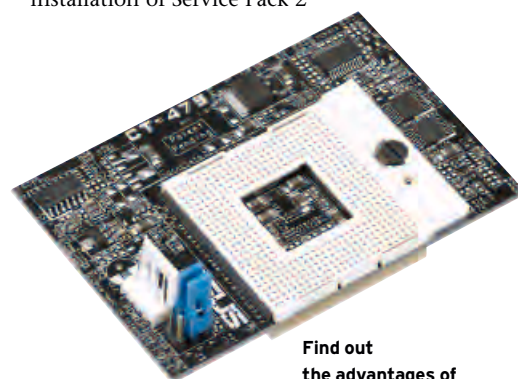
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rob_jones@vnu.co.uk

Make broadband more accessible

Rob Jones warns that finding the best broadband service is more complicated than you might think



»» **Broadband A to Z**
All you need to know about choosing a broadband provider – see page 91



»» **Sound advice**
We look at 24bit soundcards and speakers – see page 109

Everyone likes a bargain but, equally, everyone likes to make sure that, when they make a big purchase, they spend their money wisely. And with broadband, achieving both of the above is proving more and more difficult.

I will start by apologising to those of you who can't get broadband because, if you read on, you may find my comments frustrating. While I argue about the current state of broadband in the UK for those who can get it, you will seethe that dial-up is still your only option. This situation is wrong and I hope BT enables your exchange soon, but when you can get broadband it is important that you get a decent service and know exactly what you are paying for. The array of choices and offers typically attached to broadband is mind boggling, even more so now you have to sift through different speeds and usage caps before deciding on a service.

The companies offering broadband services are sound, but some have a rather cavalier approach to presenting the information you need to make an informed and educated decision. This can be especially true when it comes to usage caps, where we found that service providers just don't outline clearly what happens if you exceed your monthly allowance. Even worse, some companies claim to offer unlimited services but then throw in a well-hidden caveat that all packages are subject to their fair usage policies. As they don't explain what constitutes a fair usage policy, it is impossible to know whether you are 'exceeding' your unlimited service if you upload and download, say, 1GB a day.

We expected broadband caps to be unpopular among readers, but decided to find out by asking for your views on our blog The Test Bed (www.pcw.co.uk/labs). You can read a short excerpt in our broadband report on page 91 or see them in their entirety under the Internet & Broadband category on the blog. What surprised us was the division between users who are pro-usage caps and those doggedly against them. People who believed they were light users tended to favour caps, whereas heavy users saw caps as restrictive and wanted them to end. What really disappoints us at PCW was the way caps are typically sliced up and explained. Caps as low as 2GB or 3GB seem ridiculously small and, if ISPs are going to use caps, the starting point should be closer to at least 6GB as a minimum. While most ISPs do not currently demand more money from those who exceed their cap, it will happen in the future and offering caps as low as 2GB gives service providers a highly attractive monthly price to advertise in order to draw people in. However, muddy usage information often encourages people to choose more expensive packages, because they are unsure what a usage cap allows and how much it will cost if they go over it.

Speeds are on the rise, finally – we are moving away from 256Kbits/sec services rated as broadband, which was a disgrace. But currently, speeds of 8Mbits/sec are only available in a limited number of regions and it is hard to describe the popular 1Mbits/sec speeds as broadband. Yes, it's an improvement, but we think it is time to start campaigning for those faster broadband speeds across the country. Today, I'll accept that most users can cope with the speeds on offer, but as usage increases and becomes more inventive, higher speeds must become more widely available – and not just download speeds. Most services offering higher speeds today still only have an upload speed of 256Kbits/sec. This is fine for making voice calls and online gaming, but not so great if you have to send big emails or have your own website. Once video calls become more popular, the quality will be left wanting.

We applaud the faster speeds and lower-subscription packages that are now on offer, but there is still a great deal that needs to improve.

'Muddy usage information often encourages people to choose more expensive packages'

Performance testing is an important part of PCW's reviewing process and to obtain our authoritative results we use the UK's best PC testing resource – VNU Labs. Here we explain why you can trust our results and give you a tour of our most frequently used benchmark programs.



PCW's tests are carried out by VNU Labs, the best PC testing labs in the UK

One of the main reasons people upgrade their PCs is because their old model seems 'too slow'. But how do you tell whether the one you're going to replace it with is any faster? At PCW we take PC testing very seriously and we have the UK's best PC testing labs – VNU Labs – on tap to help us give you reliable, authoritative performance figures, to help you with your purchasing decisions.

It's true that speed isn't everything, but it's an important part of the buying equation, especially when there are so many possible combinations of components out there. As many of our PC group tests are based on price bands, checking the performance is even more important – a PC might have a lot of bells and whistles, but if the core system is underperforming compared to the rest of the group, you need to know about it before you part with your hard-earned cash.

In VNU's UK Labs, which is part of a network of European VNU Labs we call upon, our staff have over 20 years of combined testing experience and have tested thousands of hardware products in every conceivable category. We know all the perils and pitfalls of practical benchmarking, and we contribute to the development of industry standard benchmarks through our full membership of Bapco (www.bapco.com), the non-profit benchmark consortium. We are also a media member of the Futuremark Benchmark Development Program (www.futuremark.com). Below you'll find short descriptions of the main benchmarks we use for testing PC systems and components.

Sysmark 2004

Sysmark 2004 is a system productivity benchmark, designed to reflect system performance when running the most popular application software in real-world scenarios with real-world workloads.

Sysmark 2004 uses 15 full applications, plus anti-virus and compression software, divided into two categories: Office Productivity and Internet Content Creation.

It runs through predefined scripts that include concurrent running of applications to test multitasking capabilities.

Scores are calculated for each category based on the scores for various sub-tasks. Individual tasks are scored based on 'response time' – the time the system takes to complete a task initiated by the user. Responsiveness to the user is scored more highly than the total time taken to complete a number of tasks.

These scores are based on a comparison between the test system and a Bapco reference PC with a 2GHz Pentium 4 processor, an Intel D845GBV-based motherboard, 512MB of DDR266 CL2.5 Ram, a 64MB ATI Radeon 9700 Pro graphics card, an 80GB IBM 2MB cache, 7,200rpm hard drive formatted with the NTFS file system and Windows XP SP1. A score of 100 indicates that the system has a performance equal to the reference PC, 200 indicates twice the performance and so on. We run the benchmark at a resolution of 1,024 x 768 in 16bit colour. It is run three times, rebooting between each category.

When testing PCs and notebooks, we first configure them automatically with standard desktop settings. This includes removing all startup programs, automatic updates, desktop wallpaper, screensavers and proprietary system tray utilities. This is done in order to ensure the repeatability of tests.

The applications within each category of Sysmark 2004 are as follows:

Office Productivity

Adobe Acrobat 5.0.5, Microsoft Access 2002 SP2, Microsoft Excel 2002 SP2, Microsoft Outlook 2002 SP2, Microsoft Powerpoint 2002 SP2, Microsoft Word 2002 SP2, Microsoft Internet Explorer 6 SP1, Scansoft Dragon Naturally Speaking 6 Preferred, Network Associates McAfee Virus Scan 7, Winzip Computing Winzip 8.1

Internet Content Creation

Adobe After Effects 5.5, Adobe Photoshop 7.01, Adobe Premiere 6.5, Discreet 3ds Max, Macromedia Dreamweaver MX, Macromedia Flash MX, Microsoft Windows Media Encoder 9 Series, Network Associates McAfee Virus Scan 7, Winzip Computing Winzip 8.1

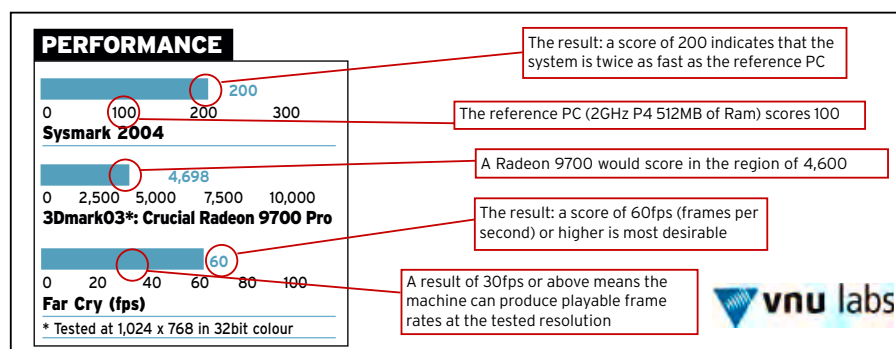
See www.bapco.com for pricing information and full details of testing strategies and methodologies.

3Dmark03

3Dmark03 consists of four tests. The first examines DirectX 7 performance; the following two are DirectX 8 and the final test is DirectX 9.

The result is calculated by taking an average of the frame rates from the first three tests. The results from the fourth test are included, but have a lesser bearing on the final score.

This version will only run fully on DirectX 9 compliant cards. 3Dmark03 is suitable for modern cards in the budget to mid-price





Far Cry is a real challenge for modern graphics cards



PCmark04 measures memory, processor, graphics and hard drive performance

ranges. For the latest cards, we use 3Dmark05. 3Dmark 2001 has now been officially retired by VNU Labs.

3Dmark05

3Dmark05 is a demanding test designed to stress the latest generation of DirectX 9-compliant cards and will only work with models that support Pixel Shaders 2 and have DirectX 9c installed.

Using the same interface as 3Dmark03, the main benchmark consists of three simulated game tests. These are designed to load the graphics subsystem as much as possible, although the CPU and other components can have an effect on the overall score, which is why 128MB of video Ram and a 2GHz CPU are part of the minimum system requirements for running the tests. For systems using older graphics cards that don't meet the 3Dmark05 requirements, we will use 3Dmark03.

Far Cry

We use the Far Cry game from Ubisoft for testing DirectX 9 gaming performance. The default demo we use is timedemo on the 'Fort' level. Far Cry's game engine is very graphics-intensive, so it presents a real

challenge to modern graphics cards. For PC and notebook testing we test at 1,024 x 768 pixels, 32bit colour, 75Hz refresh and default settings for both anti-aliasing (AA) and anisotropic filtering (AF).

When it comes to testing graphics cards, in addition to the standard test, the card is also tested at 1,024 x 768 with 4x AA and 4x AF; 1,600 x 1,200 with 4x AA and 4x AF and 1,600 x 1,200 with maximum quality settings.

PCmark04

Part-way between application-based and entirely synthetic benchmarks, PCmark04 uses a hybrid technology, employing portions of real applications to produce realistic performance results without the overhead of installing complete software packages.

It has four main suites of tests for measuring memory, processor, graphics and hard drive performance, as well as that of the overall system. For more information on PCmark and 3Dmark, visit www.futuremark.com.

Battery test

To get a feeling for the minimum length of time a notebook battery will last, we run a specific test. Based on a looping Excel Visual

Basic application, the test opens worksheets, generates random numbers and pivot tables, then zooms, and adjusts the brightness and contrast of an image. The running time is recorded to disk every 30 seconds until the battery power diminishes.

Test beds

When testing components and peripherals, we use several standard Intel and AMD-based test rigs. These are as follows:

- CPUs and memory: 3.4GHz Intel Pentium 4 Extreme Edition, AMD Athlon 64 4000+, AMD Athlon 64 3400+
- Memory: 1GB of Crucial PC5300 DDR2 Ram (Intel) or PC3200 (DDR1-400) (AMD)
- Motherboards: Asus P5AD2-E Premium (Intel); ECS KN-1 (AMD)
- Hard drive: 120GB Western Digital EIDE model with an 8MB buffer
- Graphics card: ATI Radeon X850XT PCI Express
- Operating system: Windows XP SP2

For hard drive testing, we use a dedicated Intel P4 3.4GHz system with 512MB of Buffalo PC5300 DDR2 Ram, an Nvidia Geforce 6800 PCI Express graphics card and an Intel D925XECV2 motherboard.



3Dmark05 pushes modern graphics cards to their limits



3Dmark03 is used to test DirectX 7/8 graphics cards

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Acronis Privacy Expert Suite Personal 8

Detect and remove spyware and prevent infections

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Paragon Partition Undelete

A tool to help you restore missing data

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Paragon Encrypted Disk 2

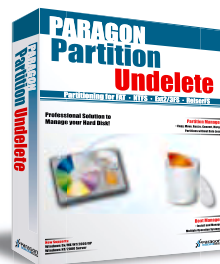
Transparently encrypt and decrypt your most private data with this easy-to-use security tool

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Panda Truprevent Personal 2005

Trap new viruses before anti-virus companies issue an upgrade, and keep your PC safe

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Featured software on the DVD

Serif Drawplus 5

Allows you to do vector drawing, web graphics, floor planning, flow charts, desktop publishing and loads more graphics tasks

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Other highlights

Buyer's guide ebooks CD & DVD

Interactive PCW guides to buying camcorders, cameras, graphics cards, hard drives, monitors, motherboards, printers, processors, audio devices and TV tuners

Linux and open-source DVD

Your chance to try out Mandriva Linux 2005 LE, the new Linux distribution and Knoppix 3.8.1, the latest update to the Live CD

Plus CD & DVD

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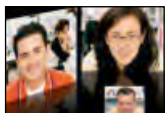
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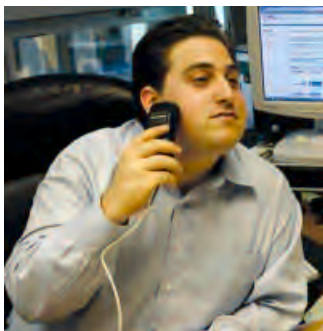
- 38 A tricky time for Taiwan as it hosts the 25th birthday of computer show Computex



Focus on video calls

- 39 The new Tiger OS from Apple supports four-way video calls. And MSN has revamped its video-messaging offering

Lots of watts may eliminate adapters



Power-over-Ethernet (PoE) specialist Powersine ran this razor from a Cat5 cable to make the point that its latest equipment can deliver more watts over a network. The company says at least two major manufacturers are developing a chip to allow notebooks to draw power from PoE-enabled hotel networks, eliminating the need to carry heavy adapters, although there would be some drain on the battery during heavy use. Double power for nets – page 135

Dual steps to the future

Computing took two steps forward last month with the formal release of 64bit Windows operating software and the debut of dual-core processors from AMD and Intel. Microsoft also gave some details of the next-generation Longhorn edition of Windows, which is due to launch late next year.

The new 64bit versions of Windows XP and Windows Server 2003 allow systems to address up to 128GB of memory, compared with the 4GB limit of 32bit code. Microsoft claims users will see a dramatic boost in the performance of processor-intensive applications such as video-editing and games.

Initially only XP Professional will be available in 64bit; Media Center and Tablet PC versions will follow. It will be available on much the same basis as the Media Center edition of XP: either pre-installed or through component suppliers; there will be no shrink-wrapped retail versions.

If you have a 64bit machine running 32bit code, you can get a free upgrade at www.microsoft.com/windowsxp/64bit/default.mspx, if you apply before 31 July. A safer move would be to get the upgrade from your hardware supplier in case there are driver issues. Otherwise, you are advised to install a trial version first to check compatibility; this was available only on CD at press time but Microsoft promises to put it online.

Microsoft chairman Bill Gates predicted that the transition to 64bit will happen more quickly than expected. He told hardware developers at the annual Winhec conference, where the code was launched: 'It will make a great platform for the next generation of software, with better performance and reliability.'

Also announced at Winhec was a new document format called Metro that some saw as a challenge to Adobe's Portable Document Format (pdf). Microsoft said it was simply part

of the document management facilities in Longhorn. Adobe's acquisition of Macromedia last month was widely seen as a consolidation in face of the Microsoft threat (see page 37).

The new dual-core processors will help future-proof PCs for Longhorn. Microsoft says this will run on any 'modern' 32bit and 64bit PC processor but will be 'better' on dual core.

But Microsoft has a history of underspecifying hardware: it claimed Windows 95 needed only 4MB of Ram, which was all most PCs had at the time. This was true if you didn't mind that the new operating system ran slower than the one it replaced; to get any benefit, most people needed an expensive upgrade to 16MB. You won't see many tears in the chip industry if something similar happens with Longhorn.

Clive Akass

- Longhorn reveals its secrets – page 20
- First dual-core processors – page 23
- Tiger stalks Longhorn – page 39

Desktop supercomputing a reality

Supercomputing is coming to (or under) the desktop, judging from two announcements made last month. Apple claims the new Tiger version of the Mac OS allows local networks to be configured easily for distributed processing, achieving supercomputer class performance by splitting tasks up between several machines.

And California-based Orion Multisystems has launched a 'deskside' system which is, in effect, a cluster of 96 PCs acting as a single system – and four of them can be stacked to provide the processing power of 384 PCs.

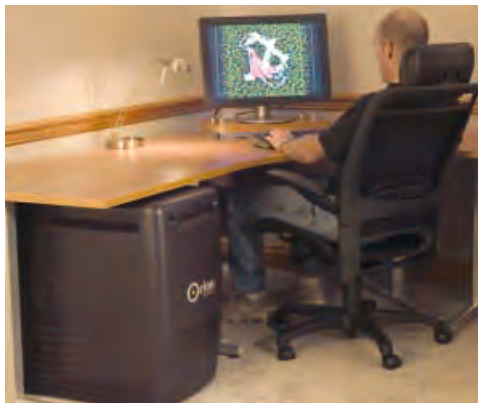
The company also offers a 12-processor system designed to sit on the desktop. All models are built around 12-node boards, each node being equivalent to a PC with its own

processor, chipset, memory and optional disk drive.

The 96-node DS-96 (pictured below) is said to be the highest performance general-purpose computer that can be plugged into a single standard power outlet. But don't expect to see it in Dixons: prices start at £54,000.

Orion Multisystems, set up by Transmeta co-founders Colin Hunter and Ed Kelly, claims it scores 110 Gflops sustained and 230 Gflops peak on the Linpack benchmark.

Prices for Orion's 96-node DS-96 start at £54,000





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64bit Windows
Is it worth making the move?
We find out what this new technology can offer you



The mobile of the future

There was some reinforcement last month for the view that mobile computers will evolve a dominant format somewhere between that of a small laptop and a large handheld.

Microsoft chairman Bill Gates flourished a tiny Tablet PC with a 7in screen that he said would support multi-modal input (see page 36), last all day without a recharge and be ready for use almost instantaneously.

The concept design could hit the market as soon as 2007, he told hardware developers at the annual Winhec conference. It would include a camera, Wifi and a phone and allow you to listen to music or watch a video.

Meanwhile Toshiba celebrated the 20th anniversary of its first laptop by launching 'by popular demand' a new version of the discontinued Libretto mini-notebook in the US. The U100 has a screen 7.5in wide, but it

weighs 2.16lb, heavier than some thin-and-light notebooks.

On the handheld front, Nokia announced a smartphone equipped with a 4GB hard disk that can double as music player. The N91, available late this year, was trumpeted as an iPod killer in the national press, as if Nokia was the first to conclude that there was no point carrying a separate phone and music player.

In fact just about every phone vendor showed player-phones at Cebit this year, including a model from Samsung with a 3GB disk. Toshiba's music player (page 22) has a 60GB disk in a format that looks as if it could fit in a phone.

Both this model and Apple's Iphoto allow you to view pictures, recognising that if you have the storage for more music tracks than you are likely to need, you may as well use some of it for images or video. That is beginning to encourage the use of larger screens: Palmone's new



Format of the future? Gates shows off the tiny concept Tablet PC

Treo 650 has a 320 x 320pixel display compared to the N91's 176 x 208pixels.

Most device makers believe a variety of formats will survive, but they are divided on which will dominate. Emerging Bluetooth stereo headsets, if they live up to their promise, will make it easier to leave your player phone in your pocket or bag while you make a call.

If Gates achieves his target price of \$800 (£420 approx) for his mini-tablet, with all the power of a PC, it could be strong competition for high-end PDAs or smartphones now selling at much the same price. It would offer standard telephony but you could also get free calls using Skype and the Wifi link.

Clive Akass

3D display breakthrough

Two breakthroughs were claimed last month in the development of 'autostereoscopic' screens that offer 3D views without the need for special glasses.

A US company called Opticality announced what it claims is the largest ever example, a 180in projection screen that uses a filter layer to direct complementary stereo images to each eye. It is on view on the Japanese pavilion at the World Expo at Aichi, Japan.

The screens, developed by Opticality's German R&D arm X3D Technologies, can be viewed up to 30ft away and have a field of view of 120°.

Toshiba said it had developed a new flat panel that uses microlenses and software to create a 3D effect. The software processes 12 or 16 images of a scene to create a 3D view.

The technology, which allows viewing from up to 30°, has been used on 24in and 15.4in displays. Toshiba plans to offer products within two years.

Laptop fuel cell



IBM and Sanyo have developed a methanol fuel cell system that can power laptops for up to eight hours. Sanyo claimed its prototype system (above) is designed to be compatible with most current Thinkpads.

Tenner broadband

UK Online is offering uncapped 512K broadband access for £9.99 a month, but only in areas with very good lines - see our Test Bed blog at www.pcw.co.uk.
• Broadband feature - page 91



The last Palm-powered model, the Treo 650 (far left), is pitched as a quad-band smartphone but could also be described as a telephony-enabled PDA. It has the usual organiser functions, a backlit Qwerty keyboard, mp3 player and camera. Nokia's N91's music player (left) is more versatile but its tiny screen is not ideal for viewing pictures

UK man gets \$10k for Moore's birthday

Intel gave a British engineer a \$10,000 'birthday present' last month. Not for his own birthday but to mark the 40th anniversary of Moore's law.

The company offered the money for a copy of the 1965 edition of *Electronics* magazine, which contained the original article by Intel co-founder

Gordon Moore predicting that the number of components on a processor would double every year and that costs would fall commensurately.

Surrey engineer David Clark had stored the magazine in his loft, then under his floorboards, for years. Moore and Intel had lost their copies. The edition

will be sent to Intel's headquarters in California.

Intel has come in for criticism from American universities after making the offer. A copy of the magazine was stolen from the University of Illinois' engineering library shortly after the announcement of the \$10,000 offer.

Itanium gets server version of new OS

Microsoft is to offer a version of Longhorn for the Itanium 2 processor, the company announced – just weeks after pulling the plug on an Itanium 2 version of Windows XP.

The apparent double-take reflects a shift in the market for workstations that tackle more demanding tasks than the average desktop, but lack the power and resilience of back-end systems.

Co-developers Intel and HP had hoped 64bit Itanium, which does not use the classic x86 PC instruction set, would span both the mid- and high-end market. But that cosy scenario was wrecked by AMD's pre-emptive launch of processors supporting both 64bit addressing and x86 code, allowing them to run existing PC applications natively.

Intel was forced to follow suit so that, ironically, the Itanium was squeezed by the company's own 64bit Xeons. HP recognised reality last year when it dropped Itanium-based workstations from its range.

In turn, that led to the dropping of XP for the Itanium. Microsoft's decision to offer a server edition of Longhorn on the platform amounts to a recognition that there remains a lucrative high-end market for the chip.

The launch is expected to come at much the same as the mainstream x86 edition.

Microsoft sued in jpeg patent dispute

Microsoft is one of 44 companies being sued by Forgent Networks for allegedly infringing a jpeg graphics compression patent. Microsoft claims the patent is invalid because Forgent was not the first to invent the technology. It also claims that Forgent should have raised the matter when it participated in the adoption of the jpeg standard.

Meanwhile Nokia, Oracle, IBM, Real Networks and Red Hat have formed a group to fight Microsoft's appeal against an EC anti-trust ruling.

Longhorn ready in 2006

Microsoft has confirmed that Longhorn, the next generation of Windows, is on track for release late next year and will support both 32bit and 64bit hardware and applications.

At the Winhec conference, Bill Gates told developers that it will bring 'dramatic enhancements' to the fundamentals of computing, with improvements to the way information is filed, found and accessed.

Folders and document icons will depict their content and files will be organised on the basis of metadata such as the author's name, subject or keyword. This sounds similar to what Apple has attempted in Tiger, the latest version of its operating system (see page 39).

Gates said there will also be features to aid deployment and manageability, including 'hot patching' to update code without the need to reboot.

He claimed that new security measures will help shield PCs from rogue code, adware, spyware and phishing scams, but Microsoft executives said they



Bill Gates gives developers the lowdown on Longhorn at the Winhec conference

have had to water down the Next Generation Secure Computing Base (NGSCB) technology that will ship with Longhorn.

Many 'Longhorn ready' systems will not support NGSCB, and a 'compartmentisation' feature, which would set up secure compartments for elements such as the operating system, computing tasks and administration and management, will not be ready. Compartmentisation was the result of an earlier about-turn by Microsoft, which had originally

planned a rigid separation of applications. 'We [will be] delivering the first part of NGSCB – Secure Startup,' Jim Allchin, Microsoft's group vice-president for platforms, said at Winhec.

Secure Startup prevents an intruder booting from a floppy or swapping out a hard drive to circumvent security. At Winhec, Microsoft replaced a session on 'How to build NGSCB-enabled systems' with 'How to build in support for secure startup'.

The security system depends on a host system having a special chip enforcing a security standard governed by the non-profit Trusted Computing Group. But the specifications for a Longhorn-ready PC, outlined at Winhec, do not mention the chip – they say systems require at least 512MB of memory and a current mid- to high-end processor.

Manuel Novoa, security architect at HP's Personal Systems Group, said that Longhorn will support the chip if it is present but it is not required.

Tom Sanders

Live comms goes mobile

Microsoft plans to extend to mobile devices the comprehensive messaging facilities offered by its new Office Live Communications Server 2005 product.

A first step will be the launch of a client providing instant messaging and presence awareness for Windows Mobile-based devices. Eventually it will also support email, telephony, texting, videoconferencing and webconferencing – across a variety of clients. Beta code will be available later this year.

● Microsoft has released 'beta 2' code for its Visual Studio 2005 development suite, .Net Framework 2 and SQL Server 2005.

Hybrid disk enables 'anytime' laptop

Microsoft and Samsung have developed a hybrid hard disk and flash drive that is said to reduce power consumption by 10 per cent. Solid-state caches have long been used to boost disk performance; the new design uses non-volatile memory to reduce the drain on batteries.

'The real secret is to limit the number of reads on the disk,' said Jack Creasey, senior

programme manager for Microsoft's Windows Hardware Innovation Group.

The cache – 128MB of it on the prototype shown at Winhec, can also speed laptop wake-up times by storing the data needed to resume.

The design may

also presage a time when all or most of a laptop's data is held in memory rather than a hard disk or other long-term storage.

However, the immediate aim is to boost battery life in devices such as Acer's 'available any time' tablet (left) featured at Winhec.



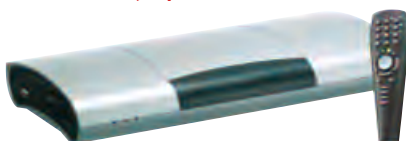
Netgem's freeview box is also a hub

Netgem has launched a £89.99 Freeview box that acts as a home hub, as well as enabling a standard TV to receive more than 30 free digital stations.

The Iplayer can pipe stills, video or audio from your PC from a standard network link to a TV.

You can also plug in a Wifi card for a wireless link.

www.iplayer.co.uk



Hush babies

Quiet PC specialist Hush has launched a new E-Series range of Windows XP Media Center models, using distinctive alloy cases that double as a heat sink. Price ranges from about £1,220 ex VAT.

www.hushtechnologies.co.uk

Toshiba takes on Ipod

Device makers still see a lot of mileage in the market opened by Apple's Ipod, and Toshiba is the latest to launch an Ipod-style player, coloured white like the original and almost as elegant.

The Gigabeat, which can hook into Napster's subscription-based music download service, is barely the size of a 10-pack of cigarettes, yet it can pack a hard disk with a capacity of 60GB.

It has a bright polysilicon 2.2in full-colour QVGA screen and comes with a USB2 cradle that can also be used for charging. There are two buttons on the cradle: one synchronises files with a PC (no Mac version is yet available) and the other rips tracks from a CD.

The device supports USB On-the-Go, which means it can download pictures directly from



Gigabeat: will need to be returned for replacement when battery runs out

a camera. There is one odd drawback: you can't view the pictures without first uploading them to a PC and then transferring them back using supplied management software

that translates them into a format the Gigabeat can read. It supports wma, mp3, wav formats and DRM9 and DRM10 digital rights management. Toshiba claims a 16-hour battery life but you have to return the Gigabeat for a replacement if the battery dies completely – one feature shared with the iPod that is likely to be unpopular with users.

The Gigabeat, available mid-June, comes in 10GB, 20GB, 40GB and 60Gb versions at prices ranging from £200 to £300.

● Motorola is on track to deliver a mobile phone that allows users to buy and play tracks from Apple's iTunes music store, chief executive Ed Zander said. Doubts were raised after the product failed to make expected appearances at Cebit and the Consumer Electronics Show earlier this year.

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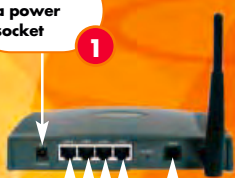


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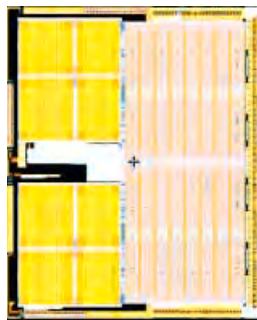
Dual-core battle begins

Intel beat AMD to market with a dual-core processor by just a few days. But it launched only a single 32bit dual-core 3.2GHz Pentium Extreme Edition 840, while AMD offered a range of 64bit Opteron server engines and promised a similar raft of Athlon64 desktop CPUs by the end of June.

Both firms are moving to multi-core to boost performance without increasing clock rates. Dual-core is more power efficient, which helps cut costs, eliminate noisy fans and, in the case of server farms, pack in more processing power (see box below).

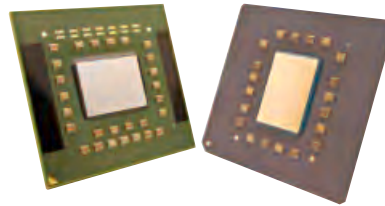
The technology can boost existing systems, including those running multiple separate processors: all the AMD offerings can be swapped in directly provided the system Bios is updated and clock rate adjusted.

Dual-core chips run slower than single-core for some processes, making comparisons



tricky. AMD claims up to 80 per cent increase in performance compared with a single-core of the same frequency. For processors with similar thermal envelopes, which define the kind of systems they can be used in, the increase may be up to 30 per cent, depending on whether the software can use multithreading.

The Pentium Extreme is a curious choice for Intel's dual-core debut, as the single-core version was launched to head off AMD's Athlon64 FX-55,



AMD has launched 64bit Opteron server CPUs, with the promise of desktop Athlon64s appearing soon

targeted at gamers. Yet the latter is the only one of AMD's high-end line-up for which there are no near-term dual-core plans.

Benjamin Williams, vice-president of AMD's microprocessor business unit, said few games could take advantage of dual-core and most would run up to 20 per cent faster on the single-core FX-55.

Three of the new Opterons are available now: the 1.8GHz 865, 2GHz 870 and 2.2GHz 875, designed for heavy-duty servers with four- or eight-socket boards. Prices range from £795 to £1,390. Available from late May are the 1.8GHz 265, 2GHz 270 and 2.2GHz 275, designed for one- or two-socket boards. Prices are from £447 to £682. The first releases are rated at 95w, with more frugal 55w and 30w versions to follow.

Four Althon64 X2 processors will be available in late June: the 4800+, 4600+, 4400+ and 4200+, costing £525, £421, £305 and £282. All figures are for bulk purchases, and converted from dollars and so are only an indication of end-user prices.

Two is not always better than one

Our first lab tests on Intel's dual-core EE840 processor produced no surprises. We compared the dual-core 3.2GHz EE840 with its fastest single-core equivalent, a 3.7GHz Extreme Edition. Overall the dual-core was 5.8 per cent faster, despite its slower clock. But it was outperformed by the higher-clocked single-core when running single-threaded applications.

In the case of the single-threaded Far Cry, for instance, the dual-core CPU was 7.57 per cent slower. This might seem to bear out AMD's claim (see story left) that games are not ready for dual-core.

However, when running Far Cry with an encryption utility in the background, the dual-core was 17.62 per cent faster because the operating system could offload the extra task to the second core.

A similar picture emerged when we ran a range of tests from our Passmark suite concurrently: the dual-core was between 32 and 102 per cent faster, again because the tasks could be split between the cores. To code that supports Hyperthreading (HT), dual-core looks like four processors, because HT treats a single CPU as two logical ones.

Intel is due to launch a dual-core mobile Pentium M later this year, but dual Xeons will not appear until early 2006 to challenge the new Opterons.

Read our full test results on The Test Bed at www.pcw.co.uk.

Staying single costs more

AMD reckons 500 Intel Nocona Xeon processors, each drawing around 111w, cost more than \$84,000 (£44,000 approx) a year to run at Californian prices. As a result, cutting the power drain on processors can save big organisations a lot of money.

The relatively low UK price of 4.1p per kilowatt-hour for large users still works out at just under £50 for a 24-hour day, or

nearly £18,000 a year, for 500 100w CPUs. So a 30 per cent reduction in power drain could save tens of thousands a year for organisations with lots of PCs.

Heat is a major issue in big installations where blade servers are stacked in racks. Dual-core means companies can increase power for the same 'thermal envelope' or reduce the heat for the same computing power.

View our test results live on the web

PCW has expanded the range of performance results we publish on our website, giving readers a far more comprehensive listing of products, how they perform in our independent tests, as well as their full specs.

We are currently the only UK title to provide such online results and, in conjunction with our reviews, the figures will help you make a more informed decision about the products you buy.

The results will be continually updated as we finish testing products that come through our labs, which are part of the largest European network of labs available to any

technology publication in the UK. You'll find comprehensive results for a range of components, such as graphics cards and motherboards, hard drives, PCs and laptops and the latest CPUs.

For most products, results are complemented by extensive specs, and for laptops, there are details about battery life and weight. You'll also find in-depth details of how we test, information on the benchmarks we use and how to understand them.

The test bed
The hottest products, news and prices from PCW.co.uk

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Top Ten performing notebook scores based on battery life

Manufacturer	Model	PCW Battery life	Sysmark04	3DMark05	3DMark03	PCMark04	Review
MSI	Desolate S21	302	121	165	0	2812	June 05
Acer	590	199	185	864	0	3084	June 05
Intellect	Storm 5710	197	155	294	0	3563	June 05
HP	273A	180	128	165	0	2828	June 05
Intellect	ProBook 11 20	172	156	111	2.64	3068	PCW Feb 05
HP	BCA170	146	137	160	0	2990	June 05
Everest	Ultimate 410	145	154	1759	0	0	May 05
Sony	VAIO-VGN-SB00	121	128	795	0	0	March 05
Sony	VAIO-VGN-SB0P	120	125	810	0	3648	June 05
Sony	VAIO-PS1172	110	138	796	0	0	PCW April 05

Click on first

All performance results, along with regular updates on new products, industry gossip and tips, are in our labs blog The Test Bed at www.pcw.co.uk/labs.

Wimax chips in for air broadband

Wireless broadband came a step closer last month, with the release of Wimax chips from Fujitsu and Intel that should bring equipment costs closer to Wifi levels. The Intel chip, codenamed Rosedale, is likely to be implemented as standard on Centrino notebooks – although, like Wifi on today's models, they will be on internal mini-PCI cards rather than motherboards.

BT will use Wimax initially to cover areas not reached by fixed lines. But Chet Patel, general manager of wireless Internet access, said it will also be used in places where the quality or length of phone lines reduces ADSL speeds – something that has led to disappointment for many users as service providers begin to boost data rates (see broadband feature, page 91).

Patel said: 'We started a large deployment in Northern Ireland months ago and we'll be offering Wimax as one of a portfolio of connection services.'



Airspan board (top right) using Intel's Rosedale chip, two views of which are pictured below it. To the left are two Airspan home modems using the board. The chunkier modem uses multiple aerials to boost range

Wimax can, in theory, offer data rates of up to 70Mbps/sec, but this has to be shared among users in a base station sector. In practice, speeds are likely to be similar to those available on ADSL.

One thing holding back Wimax is that, unlike with Wifi, there is no globally accepted spectrum available

to it. Early implementations in Britain are likely to use 5GHz bands, partly shared with the 11a flavour of Wifi; 3GHz bands will be common worldwide. Operators here and in the US are hoping Wimax will be allocated lower frequencies that will be freed up when TV moves completely from analogue to digital; these are

better at penetrating buildings. But DAB and DVB-H digital broadcasters have their eyes on them.

Scott Richardson, general manager of Intel's broadband wireless group, said the Rosedale chip should enable devices to be sold below the \$200 (£107 approx) sweet spot.

But Patel said that, as with early ADSL, installation will initially require a costly visit by an engineer. 'I reckon it will be at least 18 months before we get self-install on Wimax.'

Self-install would create an open market in Wimax modems, increasing pressure on prices. First implementations of Rosedale include models that look like consumer devices (see picture), as opposed to the chunky industrial-strength that have been available to date.

A mobile version of Wimax, governed by an emerging IEEE 802.16e standard, will widen the market still further. Fujitsu has said it expects to have a mobile chip next year.

Company problems throw doubt on rural services

The economics of rural access were thrown into sharp focus at the London launch of the Intel Wimax chip by the problems of Mesh Broadband, which was sub-contracted by Cable and Wireless to provide links to villages in Bedfordshire.

The company was not answering its phones – although its site was live – but both C&W and Bedfordshire County Council (BCC) said it had ceased trading. It had previously bought the assets of Invisible Networks, which failed after offering Wifi-based web access to Cambridgeshire villages.

The news did not surprise Jim Baker, the head of Telabria, which has been trialling wireless access provision in the South East. He said: 'You can't run a business supplying a rural service. You have got to be doing other stuff that is going to underwrite that slightly philanthropic effort. People should not be excluded

but businesses are not going to be able to do it by themselves.'

In fact the Bedfordshire project, which the council says had only 150 subscribers, was awarded £375,000 by the East of England Development Agency. An EDDA spokesman said money would only have been handed over on a stage by stage basis. 'We believe Mesh Broadband had nearly finished the project and we have every confidence that

another contractor will be found to complete it.'

One factor in Bedfordshire appears to have been the spread of fixed ADSL, due to an extension of its range and the enabling of more exchanges. This leaves the prospect of pockets that may be too expensive to reach by any method except satellite.

BT complains that its rivals are able to cherry-pick lucrative

areas while it is committed to provide blanket coverage. But Baker pointed out that a rural service it had launched in Lincolnshire was business-class only.

Telabria was due to announce its service rollout plans shortly after we went to press. But Baker said: 'Let's face it: if you choose to live in a remote area, you may have to accept that you can't have broadband.'



Jim Baker was at London's Wimax and Wireless Broadband Access Conference to promote Telabria's new product, a ruggedised access box that it says bridges the gap between Wifi and 3G.

The AP-3G is a portable Wifi access point that can provide hotspot access through the fastest available link: fixed Ethernet, Wifi mesh, 384Kbits/sec

3G or GPRS. It is upgradable to Wimax. Baker envisages coach companies buying bulk 3G access and reselling this to passengers with Wifi-enabled laptops.

The AP-3G weighs just 3lb, most of which is a battery that can run it for several hours. It will also run off a car battery.

Another target market is emergency services who may want access at accidents.

Voice on a sound footing

Speech input has become viable on PCs and will soon be available on mobiles. But it has a long way to go before you can throw away your keyboard, writes Clive Akass

Mobile phones and PDAs are about to get speech recognition technology good enough to take dictation for text messages – although most of the processing will be done by remote servers, not the handsets.

Many phones already respond to voice commands but have a limited vocabulary and lack the processing power for effective dictation. A new system, developed by Scansoft, uses the handheld device only to translate dictation into a standard format used by its speech engine. This data is then sent to the speech server over a 3G or GPRS link.

The data stream runs at about 4Kbits/sec, so cellular links have enough bandwidth, according to Scansoft's chief technology officer Mike Phillips. The company, which sells the market-leading Dragon Naturally Speaking dictation software, is in the process of demonstrating the system to operators.

Phillips admitted that noise can be a problem but said Scansoft had done a lot of work on reducing its effects, drawing on experience from the use of



Phillips: speech recognition has become possible on handsets

voice commands in cars. Handset makers will be encouraged to use array mics that can focus on a speaker and assist in noise cancellation.

Whether or not the system works remains to be seen; but it is remarkable for being probably the first consumer application of distributed processing, which could become common with fast mobile links. Even when handhelds become more powerful, they could still offload processing to save batteries.

There was the inevitable hiccup when Phillips

demonstrated the system to a convention of Scansoft voice-system builders in Malta. To prove he was not cheating, he invited the audience to suggest a sentence for dictation.

'Congratulations to our new Pope' came an Italian-accented voice. Phillips repeated the sentence. 'Congratulations to our new pope' spelled out the handset, to general hilarity.

However, the correct word was high on the list of suggested alternatives. This was impressive, as the ease and accuracy of correction is almost as important as translation. (The Apple Newton, the first handheld to depend on handwriting recognition, failed, not because of its transcription errors but because of the difficulty in correcting them).

Speech recognition has got better, thanks to a combination of faster processors, more memory, and better algorithms. So how good is it going to get?

Phillips said the error rate had been cut each year by about 20 per cent and this would continue. 'It is like Moore's Law (see page 19). We know there will be a limit but we can't see it yet,' he said.

The accuracy is all the more remarkable for the fact that it relies on just statistical analysis. But emerging multi-modal input systems are getting closer to the way we communicate in that they use several methods at once, just as we combine gesture, voice, facial expression, posture and touch.

The problems are as much ergonomic as technical. The Tablet PC allows you to combine speech and handwriting input, but there is little integration between the two.

Phillips argues that Scansoft's mobile dictation system is multi-modal in its support for keypad and pen corrections. But the ergonomics are awry as phones are designed to be held to the ear, where you cannot see the result of your dictation.

This could encourage the use of stereo headsets, when they come in (see PCW June page 36). Talking face-to-face with handsets could also extend multi-modality.

Lip-reading could also reinforce speech recognition, says Phillips. 'You can get the handset to track your lips visually to adjust the focus of the array mics.'

Making speeches is big business

Text-to-speech translation is as impressive in its own way as speech-to-text. Forget Stephen Hawkins: his famous voice, a product of early speech synthesis, is retained only as a marketing asset. Modern equivalents sound real and can reproduce the entire range of human expression – though not necessarily in the right place.

The problem, as with speech translation, is that machines do not 'understand' what they are saying. This is most obvious when they are reading unprepared text, such as emails – although the software is now clever enough to alter the

articulation of a phrase ending with a question mark.

But voice synthesis is a huge and growing market, particularly in contexts with a predictable range of expression. Its use in car navigation systems has become so widespread that there are doubts if people will bother to learn how to read a map.

Voice-response systems, of the kind being developed by most of the delegates at Scansoft's Malta conference, use both speech synthesis and recognition but have the advantage of being used in a narrow context.

The latest systems allow users to speak naturally, and capture enough key words to respond sensibly. A front end for a help desk, for instance, will use the statistics of queries and associated words to route most calls to the relevant experts; the remainder are referred to a human operator.

Machine conversation is beginning to appear in consumer devices. You could tell your TV to switch on *Coronation Street* when it is time; or your fridge say when you are out of milk. And each device could have its own recognisable voice. Scansoft's voice capabilities have

stemmed from acquisitions, including assets of the ill-fated speech pioneers Lernout and Hauspie. Recently Scansoft bought Edinburgh-based Rhetorical Systems, co-founded by Marc Moens, who now heads its text-to-speech operations.

He says that one task is to cut the time needed to develop new voices, which currently takes months. This has implications beyond widening the range of machine voices. Moens points out that Stephen Hawkins could still be talking in his own voice if it was synthesised using this age of technology before he became ill.

Flash in the pan

Adobe's \$4b (£2.1b) takeover of Macromedia last month has created a publishing giant that spans both the traditional and online media – and stands a greater chance of fighting off the threat from Microsoft.

The acquisition, which has yet to be agreed by regulatory authorities, took the industry by surprise but was welcomed by analysts. The news came before Microsoft's announcement of Metro (see page 18), which looks much like a rival to Adobe's portable document format (pdf).

Adobe has also been seeking aggressively to widen its market. It has just launched Creative Suite 2, a bundle of its flagship graphics products including Indesign, which has begun to challenge the dominance of Quark desktop publisher (see our

review in June, page 76). Macromedia's Flash, Fireworks and Coldfusion will broaden Adobe's web offerings. But other products compete directly and, until the deal is approved, Adobe was keeping quiet on what will survive – check our website for updates on this.

The betting was that Adobe's Golive will be superseded by Macromedia's Dreamweaver site builder.

Ovum analyst Bola Rotibi said the deal raised competition issues but would create a strong rival to Microsoft. 'Adobe and Macromedia both have superb cross-platform technologies and if they can exploit the ubiquity of the pdf reader and Flash and emphasise the "any client, anywhere" theme, they will be in a position to dictate the future direction of the industry.'

AA leads the way

The AA has launched a revamped version of its satellite navigation system. The AA Navigator is available as a £379.99 all-in-one system that also functions as a personal organiser and mp3 player.

It can also be purchased pre-installed in Ipaq organisers, with prices starting at £399.99 or bundled with a GPS receiver for use with a wide range of Pocket PC-based PDAs.

There is also a £129.99 software version that is an upgrade for people who own

alternative navigation systems. Charles Stewart, head of AA Geographic Information,

claims one advantage of the system is

that it can cope easily when you stray from its declared route.

'When it is clear you mean to go

another way, AA Navigator will adapt

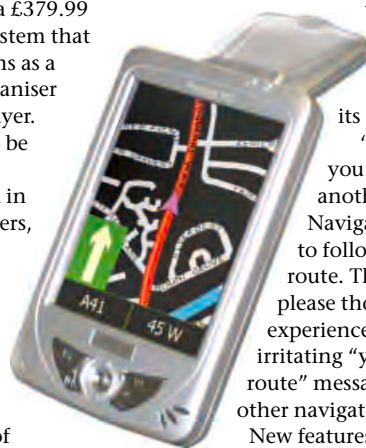
to follow your chosen route. This will certainly

please those who have experienced countless

irritating "you are off route" messages from

other navigators.'

New features include a map overview mode, zooming features and selectable male and female voices for the spoken directions.



DrayTek Voice-over-IP Solutions

DrayTek's award winning range of broadband routers and firewalls now supports Voice-over-IP (VoIP) facilities, enabling you to make use of your broadband line for voice calls instead of using your regular phone line.

Phone ports on the Vigor routers allow you to plug in a regular telephone and make calls to other VoIP users or, via the DrayTEL gateway, to anyone on a regular telephone line (fixed or mobile). You can receive calls too; either over the internet or via your personal DrayTEL phone number.

DrayTek Vigor routers are available for ADSL, Cable-modem and ISDN users - visit the web site to see the extensive specification of each model and select the ideal router for your own requirements.

Now available for cable-modem users, the **Vigor2100VG** is a router with VoIP, internet sharing, firewall and 802.11g Wireless LAN all at a great price, ideal for home users with NTL or Telewest broadband - check out full details of this exciting new product on our web site.

As well as VoIP, the Vigor router range has its regular feature-rich specification: The high performance firewall with URL content filtering, DoS protection, time scheduling, plug-in blocking and user-defined filtering all helps keep your network secure. Other features include virtual LAN, Ethernet port throttling, extensive reporting methods and an easy to manage user interface.

DrayTek VPN & Secure Wireless

The Vigor's famous VPN facilities enable easy to set up and secure site-to-site or teleworker tunnels to be linked, featuring 3DES/AES encryption and up to 16 simultaneous VPN tunnels. Wireless LAN (802.11g with WEP/WPA security) means that your portable/wireless devices can access the router facilities just as easily as your wired clients.

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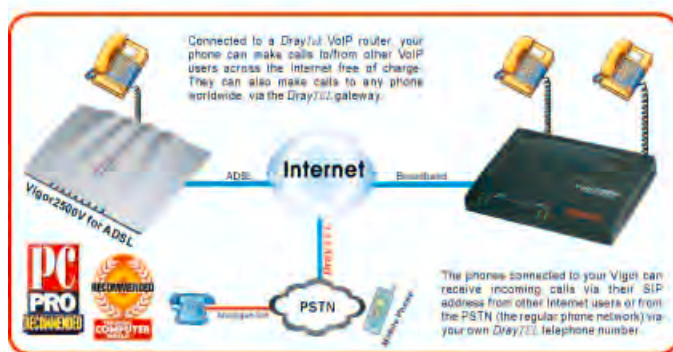
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Shadow over Computex birthday

Computex, Asia's biggest computer show, celebrates its 25th birthday this month at a tricky time for host country Taiwan. The quarter-century has seen the island emerge as the workshop of the IT industry, producing a huge range of the components and modules.

Many of these are hidden inside products, so many Taiwanese companies are relatively unknown. Even complete products such as notebooks and PCs are often rebadged and sold under Western brand names.

Nevertheless, the likes of Acer, Asus, Gigabyte, Via and Benq have established global brands. Acer achieved the remarkable feat last year of becoming market leader for notebooks in Europe, beating



Computex 2003's opening ceremony... this year's show may be a bit more edgy

HP. More impressively, it became number three in the highly competitive market for desktop PCs.

Yet Computex will still be dominated by enough peripherals and components to terrify those who fear Europe's manufacturing base is being

overwhelmed. Ironically, there are parallel fears in Taiwan.

The island's past is catching up with it. It was handed to China after World War Two, after briefly being a Japanese colony and became a refuge for Chinese nationalists fleeing Mao's Communists. China

never relinquished its claim and caused consternation in March by passing a law authorising the use of force if Taiwan formally declared independence.

Taiwan is moving closer to China economically, investing heavily in the mainland and offloading some of its work to the cheaper labour there – while echoing European concern about exporting jobs. The situation became so delicate in April that Acer founder Stan Shih offered to quit as an adviser to Taiwan's pro-independence government.

Computex, which starts on 31 May, is expected to feature the latest dual-core desktop and mobile Sonoma and Turion platforms. PCW will be reporting online from the event and we will have a full round up in the August issue.

Clive Akass

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Tiger stalks Longhorn

A major upgrade of Mac OSX, launched last month, has a revamped search facility that preempts a promised feature of Longhorn, the next generation of Windows (see pages 18). Apple describes the new release, codenamed Tiger, as its most important since it re-engineered its operating system around enterprise-class Unix code.

Tiger will be a hard act to beat for Longhorn judging from press demonstrations – see *PCW* next month for a review. The new search facility, called Spotlight (top right in screenshot), has roots deep in the kernel, just as Longhorn is expected to include re-engineered file management and search facilities.

Spotlight is fast and lets you search on every conceivable file attribute. It automatically indexes metadata and supports smart folders (see below).

Brian Croll, senior director of software product marketing, said he expected people to use Spotlight virtually as a front end for their Macs. 'It is a new way of using a computer,' he said.

Also new is a feature called Automator that automates routine tasks without the need for scripting.

A module called Dashboard provides easy access to web services and a Quicktime 7 media player supports HD-TV and the latest H.264 video format.



Video calls getting in the picture

Video calls have yet to go mainstream despite the spread of broadband access – perhaps partly because quality depends on the upstream speed that tends to be lower than downstream data rates, yet video links are viable.

Apple's new iChat AV module (see screenshot) supports four-way video conversation and nine-way audio conferencing. The four-way linkup looked good in the press demo but it was using a 2Mbps/sec uplink, over 10 times faster than most uplinks but within the capabilities of a local network.

Microsoft has just fitted a new video conversation facility to MSN Messenger using Logitech software. It can be used with any webcam and headset, but Logitech offers both for about £40 inc VAT.

Garreth Hayes, Logitech's European product manager for webcams, said the new software is the first on MSN to be coded from the ground up for a simultaneous voice and video link. He stressed: 'This is for broadband users. You need a minimum upstream speed of 150Kbits/sec.'

The module does not support multiple users: 'Obviously we are looking at what Apple are doing... Multi-party calls are good, though I think we could implement [them] in a better way than Apple.'

Hayes said the effect shown in the screenshot, with three participants arrayed as on a dressing-table mirror, was a lot of work for the processor and left people staring into space. 'Eye contact is the key thing,' he said.

>> Pocket desktop

USB drives that let you carry your PC workspace in your pocket will be available by Christmas, after a deal between a US and an Irish company.

Technology from California-based U3 will provide secure storage of data, personal settings and applications that can be launched on any PC. The company says the drives can save you carrying a laptop.

They will be made by County Mayo-based Clever Stuff and sold under the name Disgo. U3 chief executive Kate Purma said: 'People will be more productive when they can use any computer they come across and still have personal information, applications and settings at their fingertips.'

>> Net monitor

A new utility lists computers connected to your PC and their processes. Microworld's free ViewTCP monitoring tool can pinpoint remote network addresses suspicious applications are accessing and log the activities of spam and spyware. Go to <http://mwti.net/antivirus/viewtcp.asp>

>> Small drive

Seagate has launched what it claims is the world's highest-capacity 2.5in notebook drive. The 120GB drive heads the Momentus 5400 range and a 100GB drive heads the sibling Momentus 7200 range. The ranges differ in their spin rates of 5,400rpm and 7,200rpm.

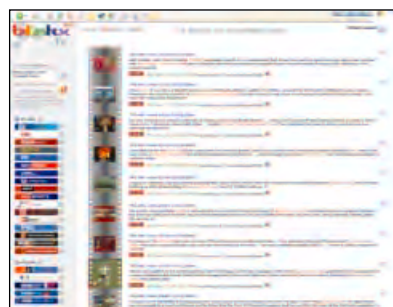
Blinkx is smarter with folders and TV searches

Some of the functionality of Tiger's Spotlight (see above) can be found in the free search utility Blinkx, from which Apple appears to have copied the idea of smart folders.

The utility's developer, also called Blinkx, claims to have been the first to use these, which continually store the results of a search. Version 3, launched last month, lets you share smart folders and post them on blogs to keep others posted, and it indexes Lotus Notes email archives as well as Outlook.

It is said to be unique in indexing fully the content of TV and video clips. This feature is currently restricted to web content, but is supplied to TV companies for internal use.

Most image searching relies on captions or metadata in files, but specialist engines can find pictures similar to a given example. BBC researchers have helped develop an XML-based content description language that could be broadcast with programs and make them as easily searchable as text, but it would



need to be integrated into the production process to be viable.

Blinkx looks at clips on the web and translates the spoken content

at double real-time. Co-founder and chief technology officer Suranga Chandratillake claims the translation is about 95 per cent accurate for indexing.

Blinkx differs from Google-type search engines in using 'implicit queries' rather than keywords. It analyses what

you are doing on your PC and collects related local and web material in the background.

www.blinkx.com.



Send your letters to:

The Editor, PCW, VNU Business Publications,
32-34 Broadwick Street, London W1A 2HG



Send your emails to:

letters@pcw.co.uk

Letters

Low-cost DTP software >

Your review of low-cost DTP software in PCW's May 2005 issue (page 125) states that: 'Even the normally prolific open-source movement seems to steer clear of DTP software. The best thing we've come across in the open-source world is KWord'.

What about Scribus (www.scribus.net)? This comprehensive and versatile open-source DTP package has been available for a while – certainly before your research – is a match for the proprietary packages which you tested, and would have been worthy of inclusion in this group test.

More on Linux in PCW please!

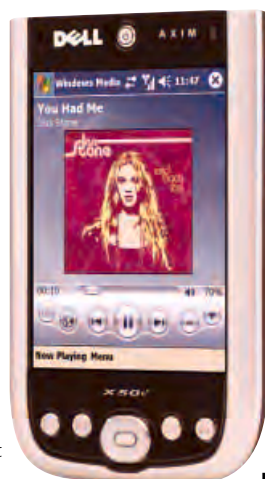
Mike Lucas

Kelvyn Taylor replies >

Unfortunately there's no Windows port of Scribus available – which was one of the requirements for our group test. However, whenever possible, we try to include open source software in our group tests and reviews.

Old PDAs for new? >

I read with interest your review of the Dell Axim X50v in the May 2005 issue (page 57) as I recently bought this particular PDA. Unfortunately, it developed a fault and the unit had to be replaced.



On receipt of the new unit I was horrified to discover I had been sent a refurbished replacement. After three months use my £350 PDA had been replaced with a secondhand device. Dell technical support explained this was their policy.

Surely this can't be right. I logged a complaint via the Dell website and was "promised" that someone would contact me within 24 working hours. I have since sent two more complaints without any response.

On browsing Dell's website, I have been unable to locate a phone number for complaints (although sales numbers are everywhere, funny that).

If this is standard policy, then what an industry this is becoming. If my TV breaks down within three months, I don't expect it to be replaced with a refurbished unit.

If manufacturers are confident in the quality of the products they sell, then surely their policy would be to replace the faulty product with a new one. I have found the whole Dell experience extremely frustrating.

Curtis Randle

Dell Axim X50v: refurbished models are no alternative

The author of the Letter of the Month will win a Trust Bluetooth Wireless Tablet BT446.

With a stylish and ergonomic design, the tablet can be used for activities such as drawing, sketching, picture editing and handwriting. The tablet connects via Bluetooth (adapter not included), so you won't have any trailing wires getting in the way. You can find out more about the Bluetooth Wireless Tablet and other Trust products at www.trust.com or by calling 0845 609 0036.



Kelvyn Taylor replies > We forwarded Mr Randle's complaint to Dell, and he has now been given a brand new replacement Axim, with a memory card thrown in.



Letter of the month

Moore's Law revisited>

Kelvyn Taylor wrote (PCW, June 2005, page 38) about processor development at Intel.

The semiconductor industry thrives on innovation: it's one of the most competitive markets in the world. The computer industry looks staid by comparison.

The force that drives semiconductor process development is competition. It's you and I, demanding faster processors. It's your daughter or son, insisting on the latest mobile phone. To create the components that provide the core of those products, semiconductor manufacturers innovate, design and create at an unprecedented rate.

Gordon Moore looked at the innovation around him and summarised its progress in a neat phrase. I suspect that it's the press rather than he who named his observation 'Moore's Law'.

Mr Taylor writes: 'The importance of Moore's prediction is that it's effectively the basis of Intel's business model'. He misses the point since it wasn't a prediction, but an observation, and Moore's observation applies to the whole semiconductor industry, not solely to Intel. Also Intel's business model is based, as are many others, in



Moore: observed progress

useful chips. That's 100 per cent more.

the semiconductor industry, on market demands, sales forecasts, production capability and ability to innovate. I doubt that you could find any single company in Silicon Valley that would come up to basing its business model on Moore's Law.

Finally, let me correct Mr Taylor's arithmetic. He writes: '300mm wafers produce some 30 per cent more cores per wafer than 200mm wafers.' A 300mm diameter wafer is just over twice the area of a 200mm wafer: for a given semiconductor die size it will yield about twice as many

Jon Summers

Kelvyn Taylor replies > Thanks for pointing out my mistake – the 30 per cent refers to Intel's hoped-for cost reduction per core that the transition to 300mm wafers should bring.

A Tiny success >

I wrote to you recently regarding my after-sales experience with Tiny.com. You kindly forwarded my email to a contact within Tiny, who very quickly responded with an email apologising for the delays. My computer was collected and very quickly repaired (four days from collection to return). I'd just like to take this opportunity to thank you for your intervention, without which, I would probably still be on my umpteenth repeat letter.

Very briefly, my experiences with Tiny.com are a bit like the Curate's egg – good in parts. On the positive side, you get a well-specified computer at a very reasonable price. The installed components are from well-known companies and if everything works 'out of the box' it will be a good experience. However, if a problem occurs with your new computer, the experience will not be a good one. Tiny's helpline is an expensive joke; it feels like the company will tell you anything to avoid having the computer sent back for repair.

It would be a shame to see the latest incarnation of Tiny fail, but fail it will unless its after-sales department pulls its finger out.

John Morgan

Kelvyn Taylor replies > We're glad to be of help and we're also happy that Tiny showed an interest in sorting out your problems.

Barred shortcut >

My wife and I have worked our way through several computers running Windows 3.11, 95, and 98 in conjunction with Microsoft Office 97. We then bought two Dell Dimensions with XP Home Edition. Mine was supplied with Office XP and my wife's with Office Works.

It proved to be a mistake not to have Office XP on both, so I bought an extra retail copy. I have now bought a Dell Inspiron laptop to improve our flexibility, and made sure I had Office pre-installed. "Yes, that will be Office 2003," said the salesman.

However, setting it up to match our desktops I find there is no Office Shortcut Bar, nor can I copy that small file from the desktop to the laptop.

How Microsoft can deliberately leave out such a useful feature baffles me. Presumably it will soon bring out Office 2005 at even greater cost with the Shortcut Bar as a major 'new' feature.

For years I have raised an eyebrow at the hate mail and grumbles about Microsoft, but now I am a convert.

I only Hope Bill Gates can feel some of the pins as I stick them into his wax effigy.

Vince Emmerson

Kelvyn Taylor replies > Microsoft's answer to this (<http://support.microsoft.com/kb/822573>) is that you can use XP's Quick Launch toolbar as an alternative for launching programs or files. It's not quite as elegant, but it just about does the job.

Linux wins over 64bit Windows >

I share Mr Stewart's disappointment over the time it is taking for Microsoft to roll out its 64bit OS (Letters, June 2005).

When I went 64bit I wanted to install something that would take advantage of my new hardware. First I tried Microsoft's time-limited demo edition of 64bit Windows XP. The whole thing was a shambles, the biggest problem being the lack of drivers from both Microsoft and hardware manufacturers.

I have always had my eye on the Linux scene and thought it was a prime opportunity to give it a go. I downloaded a 64bit distribution, burnt it to my DVD and booted my machine. Throughout the whole installation it didn't ask me for a single driver, furthermore it recognised my USB phone and TV card and installed the drivers for both of them. It even had Skype as a preinstalled program.

Windows still says it can't recognise my SATA hard drive. Need I say more?

Charles Gargen

Kelvyn Taylor replies > Driver support should have improved drastically in the release version of XP x64 Edition (see our feature, page 103). But it's not guaranteed that all manufacturers will rewrite drivers for older hardware.

Long-term laptop niggles >

I am writing this to you on my Sony Vaio VGN-FS115Z, which I bought as a result of the review I read in your April 2005 issue, where it got both a Recommended and Best Buy award. I have previously owned a Sony PCG-X18 and felt happy to continue with the brand.

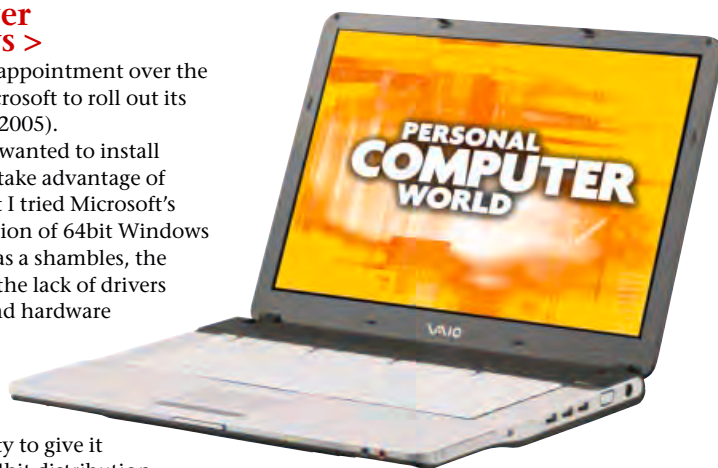
Having now owned the FS Vaio for a couple of months, I'd like to offer my experience of using the laptop.

The general feel of this machine is that it has been engineered and manufactured on a budget and it is not of the pedigree I expect from Sony. The most irksome aspect is the two dead pixels glaring at me from the screen.

I intended to upgrade it to 1GB of memory, but both available sockets are used with 256MB chips, so I am forced to buy two 512MB chips (Sony wants £338, Crucial charges a more realistic £108). I have subsequently discovered that the professional model, the VGN-FS115XP, uses just the single 512MB chip.

Other niggles include no telephone or patch cables for the integrated modem and network sockets. Accessories such as spare batteries and port replicator have only just become available.

I am now waiting to send it back for a warranty repair (no quibble) as the right hand-locking catch (made of plastic and the one that operates the 'lid's shut' micro-switch) has broken through the stress and strain of gently opening and closing the



Sony Vaio VGN-FS115Z: engineered and manufactured on a budget?

lid about 50 times. But Sony doesn't have the replacement part in stock.

In short, the spec is great and I can't refute what was said in your review – technically it is spot on. But the real-world practicalities of the machine seem very different in reality.

I accept the fast nature of computing, but is it possible to revisit some of the more popular Best Buys with extended use reviews?

Michael de Whalley

Kelvyn Taylor replies > Although we do our best to spot potential problems when reviewing systems, it's hard to pick up some of the things you mention in the timescale of a review. We'll definitely investigate your suggestion about longer-term reviews.

Spy vs spy >

Thank you Guy Kewney. I read your column on Spyware (PCW, April 2005) at just the right time.

My wife's computer had been getting slower so I decided to give it the once-over. Apart from disabling a great many totally unnecessary start-up programs, cleaning out the hard drive and defragmenting, I ran Registry Mechanic which discovered a large number of errors, Spybot which found an equal number of nasties and Ad-Aware which discovered 117 files left on her computer.

Why can't we call the police or some authority to stop computer spyware? Where do they get the right to install things on other people's computers?

I find the whole business of spyware totally abhorrent, but I am mystified as to why it is allowed.

Paul Farrell

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gordonl@pcw.co.uk

Gain power with a clear conscience

Gordon Laing explains how PC performance need not be compromised for environmental responsibility

Most of us are becoming pretty savvy at conserving power. We turn our lights off, buy energy-efficient domestic appliances and understand that a TV on standby is powering more than a little red light.

But as PC components continue to improve, one casualty is their increased power consumption. According to Intel's spec sheets, the Thermal Design Power rating of a 3.4GHz P4 is no less than 115w, almost 10 times more than the original 60MHz Pentium launched just over a decade ago. Of course, it's also much faster, but should we always accept increased speed at the cost of everything else?

Hotter processors require greater cooling, often at higher cost and almost always with more noise. Admittedly a number of manufacturers have tackled quiet cooling, but it's often expensive and prevention rather than cure is a more sensible approach.

Advanced cooling systems may allow hot processors to run quietly, but there's still the question of economics. In the past decade alone, the average rating of PC power supplies has doubled. While power rating is no indication of consumption, these heftier supplies have become necessary to support increasingly hungry components when operating under heavy loads.

The enthusiast market may promote brutish 500w PC supplies and upward, but how many other devices in our homes and offices require this much power? Devices that could out number TV sets and may be switched on all day?

I believe we should become more responsible about PC power consumption but, like most people, I am torn between environmental friendliness and performance. After all, I'm the guy who'd overclock his kettle if he thought he'd get his tea any quicker.

So what's the solution? One of the leaders in low power consumption is Via with its range of Epia mini-ITX boards. These employ integrated processors on a compact motherboard that enables low power and innovative form factors. The trouble is, while the processor performance is fine for general office and modest entertainment applications, it's not enough for more demanding tasks.

If only there was a platform that could play high-definition video without breaking a sweat, play the latest 3D games and speedily encode video, but with a fraction of the heat- and power-consumption of a typical desktop. A platform that's fast, cool and economical.

In fact, such platforms have existed for some time – look no further than mobile processors. Their power-saving technologies may have been developed to extend battery life on a portable, but could equally save electricity on a

mains-powered desktop. They generate less heat, so a desktop system may be cooled by a heatsink alone and the performance could far exceed your expectations.

Take Intel's Pentium M processor, developed as part of the original Centrino platform. The latest range has a Thermal Design Power rating of 21 to 27w, less than a quarter of a high-spec Pentium 4 desktop chip. And don't be fooled by their relatively modest-sounding clock speeds of 1.5 to 2.13GHz – these processors can match the general performance of a desktop P4 clocked considerably higher.

The Pentium M sounds ideal, but how do you get it on a desktop? Traditionally you'll only find it and the accompanying chipset in Centrino notebooks. Intel's happy to sell Pentium M processors to anyone who wants them, but it's taken Taiwanese manufacturers to realise its potential by developing desktop solutions for it.

Specialist industrial products aside, Aopen was first to launch a Pentium M motherboard for desktop PCs. The i855GME-LFS employs the original i855 Centrino chipset, but has traditional connectivity for full-size desktop devices

such as IDE drives and PCI or AGP cards. You can buy the Pentium M processor from stores such as www.ebuyer.com; at the time of writing, the 1.6GHz model 725 and 2GHz model 755 cost £122 and £240 ex VAT respectively.

I built my own PC using the Aopen board – see this month's Hands on Hardware (see page 154). What I can tell you is this: the 2GHz Pentium M matched the Sysmark 2002 score of a 3GHz Pentium 4 system while consuming

around a third of the power and the supplied fan rarely switched itself on, resulting in a virtually silent system.

Admittedly, while the 2GHz Pentium M is roughly as quick as a 3GHz Pentium 4, it's also around double the price; the Pentium M motherboard also costs more than one designed for a P4. Consequently the Pentium M is never going to be a budget option for desktops – in terms of initial cost anyway – but at least it proves you can have a system that runs fast, cool, and economically.

Where the Pentium M could make a name for itself on the desktop is for silent media centres. Aopen's second-generation Pentium M motherboard featuring Intel's latest PCI-X i915 chipset is designed for this purpose, with on-board high-definition DVI and component video outputs.

If you're concerned about power consumption and noise but aren't willing to accept compromised performance, I'd recommend building a desktop system around a Pentium M. Intel may market it as being designed for 'exceptional mobile computing', but I'd argue it's their most compelling desktop processor yet.

'Like most people, I am torn between environmental friendliness and performance'



guyk@pcw.co.uk

Media consumers are so predictable...

Guy Kewney believes that technology will soon be able to second guess our every move

If there is one unshakeable law of the media, it is that it gets more and more complex; it never simplifies. Admittedly, my memory doesn't go back to the days of painting on cave walls, so I'm not prepared to say that the cave painters were the media of their time, but the phenomenon of 'adult illustrations' goes back at least that far and the personal computer didn't create the porn business, despite what some politicians seem to think.

What I can remember, however, is the early days of TV when it was pretty much taken for granted that that was the end of radio and probably newspapers. And as for books... forget them.

So today, we look at electronic books and, once again, there are anxious people in the publishing industry shaking their heads, saying that paper books are doomed. And of course, magazines will die when e-magazines take over.

But old media doesn't die. Change, yes: today's newspaper is certainly very different to the monsters published before the Second World War. But the shift from hot-metal typesetting, where a newspaper was a publisher who owned a print works, to today's papers where you can pick up a copy of the *Financial Times* in Taipei before Londoners can wake up and read it, is nothing compared to what is on the way.

In this area, the personal computer really is changing things, in ways that we still don't begin to guess, but that we are starting to see.

For the last six months, I've been a user of Google mail. I also use the Google toolbar on my browser. The results of Google analysing my email and browsing habits are, frankly, as astonishing as I suspected they would be. For example, about 10 per cent of the advertisements I now see from Google are for press releases in personal computing and wireless. As I wrote a couple of months back, the retailer is regaining control of what consumers buy over the Internet and the traditional mass-market media is fading.

However, that doesn't mean that printed newspapers are about to vanish. Quite the opposite; I think they are just about to change in ways that are impossible to predict because there will be so many versions.

If we assume that Google continues to be seen as a great way of discovering neat new stuff, rather than as a threat to privacy (either could be true, of course) and that its influence and technology expands the way it has been developing, then we can predict that an advertiser will be

able to describe you, accurately, and send you an advertisement that exactly anticipates your needs.

Most people seem to be anticipating, somehow, that this advertising will be done on your PC display or your mobile phone. I think it will, but I also think there are limits to the situations in which you will want to use high-tech, where paper will be valuable.

My vision of a typical day, in a decade, suggests that at the point where I touch in with my commuter card, a copy of *Guy Kewney Daily* will be printed and waiting for me. The front-page article will probably be picked from my known obsessions but, equally, it could include two or three urgent emails from people I'm known to be frantic to hear from; plus some messages from people in my family. And there will be unpublished press announcements that match the articles I'm currently researching, reviews of classical concerts and sci-fi books and a few local scandals about council spending where I live. Plus, of course, adverts for the book stall I'll walk past when I get off the underground train or the pizza place I'll pass at lunch...

When I first had this vision, I imagined huge, ultra-fast printing presses doing the ink-work. That may yet happen – there are developments that mean it's cheaper to produce a one-off newspaper than to produce 100 and throw 40 of them away unsold. But those developments aren't necessary. All that's needed is a way of franchising existing printer owners – basically, you and me. Or a way of

harnessing the IT infrastructure of the National Lottery network.

The delivery of the paper – once marked with ink – isn't going to be the challenge. The challenge will be to make sure that it only gets printed at the point in your daily journey where you will want it, so it isn't thrown away.

That's where the PC, phone and Internet will triumph because, essentially, human beings are predictable animals. I may not know the exact year of your life you set up home with a partner, but I'd be a fool to bet that you won't. Most people do. And when they do, they usually require a mortgage. I may not be able to predict at the time of your birth the day you will apply for that mortgage, but pattern recognition will spot the changes before they happen, in plenty of time.

Nobody will sit in a control room and say: 'Oh look, they've browsed three real-estate agent sites in Plymouth,' but the system will know. It will be done by mindless pattern matching. And, I suspect, it will be spookily accurate.

'In my vision of a typical day, in a decade, a copy of *Guy Kewney Daily* will be printed and waiting for me'



barryf@pcw.co.uk

Copy protection or chaos theory?

Barry Fox argues that Hollywood's battle with piracy seems bogged down with confusion and contradiction

In Hollywood's words, let's cut to the chase. Professional pirates will always find a way to get new movies on the street long before they are released to pay-TV or home video. They only have to bribe or blackmail one projectionist, steal one preview tape or smuggle one camcorder into a cinema. One pirate can copy another's DVDs. The aggrieved pirate is hardly going to sue for copyright theft.

But Hollywood still develops ever more obstructive copy-protection technology that makes pay-TV and home video viewing more of a pain for the paying customer. The latest development is called AACS – Advanced Access Content System – which Warner and Disney have been working on with Intel, Microsoft and IBM, along with Sony, Panasonic and Toshiba. It is an encryption system for blue laser discs, which can 'self-repair' if hacked.

The disc replicator gets a Media Key Block that is put on every movie disc and the player manufacturer gets de-encryption Device Keys built into every player. When the player plays a disc, the Device Keys work with the MKB to unlock the movie.

Each disc also carries a Content Revocation List that blacklists keys that have been hacked. When the player plays a disc it checks to see if there is a new CRL and stores it in non-volatile memory. From then on the blacklisted keys become unusable. So the player behaves differently, not playing some discs it once played, or not playing any discs at all.

However clever AACS may be, it is useless if what comes out of the player for screen display can be copied. So the movie industry has been pushing HDCP (Intel's High-bandwidth Digital Content Protection) that encrypts the digital programme as it goes to the screen.

It took until January this year for European electronics trade body EICTA to announce an HD-ready logo to identify screens with DVI or HDMI HDCP. It then took until March for EICTA to announce a logo-licensing scheme.

The same month, Sky issued a clear warning about the HDTV service promised for early 2006: 'Most HDTV content will be protected by HDCP. This means most HDTV content will only be able to be viewed on display devices that have HDCP software built into them.'

Soon after, Astra's Chief Commercial Officer Alexander Oudendijk told a London conference that out of 75 plasmas tested, only one – from Pioneer – had digital inputs.

Sky then sent me a personal note: 'Analogue connection using component connections (Y, Pb, Pr) will also be possible'. But surely this contradicts what Sky had clearly pronounced? Sky subsequently confirmed: 'After

further consideration... we're now allowing analogue component (HD) connection as well as digital. 'Although the 'original intent was that HD content would only be viewed using HDMI and DVI protected by HDCP... we've decided that our HD receiver will initially support both HDMI/DVI and analogue component HD connectors'.

In April, Sky added: 'All HDTV channels retailed by Sky will be available in full resolution using the component connection on the initial batch of HDTV boxes.'

So the high-quality analogue HDTV output from Sky's receiver will be unprotected by digital HDCP, which is just what Hollywood has resisted. The same situation exists for blue laser discs. The players will need analogue component outputs or almost no-one will be able to use them.

Although there are no consumer recorders with HD analogue component inputs, there are professional decks that can be used to make a first copy. Macrovision confirms that its 'analogue copy protection is not available for HD analogue video output signals'.

Hollywood's trade body, the Motion Picture Association, was clearly unaware of Sky's u-turn. But the MPA is confident that now there is an HD-ready logo, homes will fill with digital input screens. Doubtless this explains Sky's talk of only the 'initial batch of HDTV boxes' having an analogue hole.

I suspect the MPA is underestimating the number of analogue screens already in homes, and those that will be sold as EICTA's logo scheme begins.

I have suggested to EICTA that a Not-HD-Ready logo would be of more practical

use to consumers. 'This set is not HD-ready – it may either not display HDTV programmes at all or not display them in full HD quality'. I'm not surprised EICTA ignored me.

So what happens when Hollywood wakes up to the gaping size of the analogue hole and so do the companies hoping to earn a premium by selling special concert and sports events in HD?

There is hidden weaponry inside the new copy protection systems. Over-the-air or off-disc trigger signals will be able to switch the receiver's analogue output on or off, and between full and deliberately degraded resolution, depending on the value of the programme material. This, the MPA says, is already being considered in the US.

So promotional HD material will sparkle in 720p or 1,080i resolution; but box office movies, big fights and Robbie Williams specials will appear in interlaced 625-line PAL. It won't be worth copying, but it won't be worth paying an HD premium for either.

And all the time the men in pubs and on street corners will still be selling pirated DVDs.

'However clever AACS may be, it is useless if what comes out of the player can be copied'

Reviews

■ EDITED BY CHRIS CAIN

EXCELLENT ★★★★★ VERY GOOD ★★★★★ GOOD ★★★★★ BELOW AVERAGE ★★★★★ POOR ★★★★★

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The Mesh Elite Extreme is a super-fast PC with amazing graphics



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T-Mobile's MDA Compact offers a large-screen phone and PDA with Bluetooth capability



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If you want a comprehensive suite of multimedia tools, then check out Roxio Easy Media Creator 7.5

This month our reviews section plays

host to two new technologies, as well as improvements on existing hardware and software. Whether you're looking for a whole system, an upgrade to your existing one or simply a better way to edit videos and burn CDs, there's sure to be something to grab your interest.

Kicking off the hardware, Tiny's Media Center SL finally brings Microsoft's home entertainment-orientated version of Windows to the masses. Although it offers a budget experience to match its price, Tiny's latest could help accelerate the growth of this technology across the UK. Hi-grade is also helping the Media Center cause with the release of its updated DMS II 3400.

Even more exciting is the first system we've seen powered by Intel's brand new Pentium 4 Extreme Edition with 64bit extensions. The Mesh Elite Extreme PBX proved to be the fastest PC we've ever seen, snatching the Sysmark record away from a dual Xeon machine. Given that the machine wasn't even running 64bit Windows, it's clear there are going to be some amazing systems over the coming months.

Another first in this issue comes from Evesham. It's Quest Explorer notebook is the first to be based around AMD's new mobile processor, the Turion 64. Aimed directly at Intel's Pentium M, the chip allows for affordable and ultra-portable 64bit computing.

Those looking to upgrade or build a quiet new system should turn to our components and overclocking sections, starting on page 69. Here you'll find the latest in motherboards, cases, graphics cards, cooling systems and memory.

On the peripherals front we look at new portable storage options, monitors, digital cameras, PDAs, and HP's latest projector. Particularly novel is Lacie's Silverscreen, an external hard disk that can hook up to your TV to play movies, photos and music. With summer on the way we also round-up waterproof gadgets you can take to pool.

Meanwhile, Roxio has added even more power to its Creator multimedia suite. Version 7.5 includes no less than 17 applications, with everything you need to edit video and audio, create CDs and DVDs, polish your photos and then backup your hard work. We also review Corel's technical drawing package, Designer, and check out Openoffice.org 2 – the free rival to Microsoft's industry leading suite.





Seagate Pocket Hard Drive
Check out this pill-shaped drive you can carry in your pocket on page 66



Asus My Pal A730W
A fully-featured Pocket PC at a good price, see page 69 for more

MEDIA CENTER PC

Tiny.com Media Center SL

A Media Center PC designed for the living room and aimed at the budget-conscious buyer



Microsoft's Media Center may have arrived some time ago, but it's not until the low-cost PC suppliers start selling these systems that you know they're here to stay. The Tiny Media Center SL is proof that OEMs are beginning to give Microsoft's favourite OS of the moment a hard shove in the direction of the mass market.

Once the VAT man and courier have taken their share (and Tiny computers cannot be collected), this computer will cost you £738 – a price designed to hook budget-conscious users. As specs go for Media Center, the SL looks reasonably good value. The AMD Athlon 64 3500 has a clock speed of 2.19GHz and is backed up by 512MB of DDR Ram, with empty slots inside the case to boost this up to 1GB.

Graphics and sound are on-board however, so digital entertainment on this PC is more TV and film than power gaming. Meanwhile, a Sysmark 04 score highlights another potential

problem as 156 is poor – we would have expected it to be 180 or higher – and made us wonder whether this system is little more than a glorified TV tuner and DVD player. The system's 200GB hard disk may seem small compared with other Media Centers we have reviewed, but most of those tipped over the £1,000 mark and the target audience at this price isn't likely to be dissatisfied. In terms of external expansion there are four USB2 ports hidden under a flap at the front, with another four and a Firewire socket at the rear. Other highlights include a slot-loading dual-layer DVD writer, plus a wireless mouse and keyboard.

Media Center is as much about style as substance and the Tiny SL strikes a decent pose. It's not as deep as some on the market, and the obligatory black and silver styling, complete with a blue LED power switch in the centre, means it will blend in with the various videos, DVD

players and set-top boxes that it hopes eventually to oust from the living room cabinet. What a shame then that you have to plug in a separate and rather large IR receiver to use the supplied remote control. It has a decent length cable to help move it to a convenient and less ugly position, but in style terms it's like wearing an Armani suit with wellies. The receiver should be housed in that stylish front cover, like other entertainment devices.

Another problem with fitting this PC into a TV cabinet is cooling. Fans are positioned side and top, but the tight confines of standard TV display units and presence of other heat-generating devices could herald performance problems due to overheating. Many Media Centers suffer from this, but that won't console buyers.

Putting the price of this computer into context with rivals, it should be said that no monitor is included. As well as the £738 base price, Tiny is offering the PC in a special deal with a 32in LCD TV for an extra £999, bringing the total to £1,698, but we couldn't review the LCD as the unit supplied was broken. That's expensive for home entertainment, so budget users attracted to the PC alone will be sad to learn that it provides no DVI connection for

digital quality output to monitors. An S-video output, while still analogue, at least gives some options over the basic composite TV connection. One benefit of composite, in fairness, is that it will connect to just about every standard TV.

While some companies are offering entertainment PCs with XP and generic media management software on top, Tiny has opted for the real Microsoft thing. It's possible to recreate the XP Media Center experience using mostly free software on top of XP, but the branded version takes away the pain for less confident users. A 60-day trial of Microsoft Office is standard on all Tiny products but Works V7 is supplied for users who don't want to pay the upgrade fee when the complementary licence expires.

Microsoft will hope that PCs such as this get home users chatting over the fence about the benefits of Media Center, but the lack of digital outputs makes the Tiny Media Center SL unconvincing as a decent productivity or entertainment PC. However, you can't slate a budget PC for providing a budget experience.

Paul Allen

DETAILS

RRP £699 (£595 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Tiny www.tiny.com

E-codes – PC only: E10269;

PC & 32in LCD: 10015

SPECIFICATIONS

AMD Athlon 64 3500+ • 512MB DDR

Ram • 200GB hard disk • Dual-layer

DVD writer • Analogue TV tuner

PROS Good value

CONS No integrated IR receiver; no DVI output

VERDICT

A good attempt at a budget Media Center PC, but those serious about home entertainment will be better off spending more

FEATURES

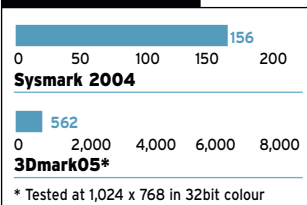
PERFORMANCE

VALUE FOR MONEY

OVERALL



PERFORMANCE



TURION 64 NOTEBOOK**Evesham Quest Explorer**

Powerful portable with long battery life



Evesham's Quest Explorer is one of the first notebooks to use AMD's new Turion 64 CPU – a mobile version of the Athlon 64 designed to help regain ground lost to Intel's Pentium M.

While the Quest Explorer represents a shift in AMD's focus towards thin and light notebooks, Evesham's choice of chassis places it somewhere between an ultra-portable and a desktop replacement. It's more manageable than most current AMD-based notebooks, but its 2.9kg frame isn't suited to being carried for long periods of time.

We also had mixed feelings about the specification. The system has enough grunt to perform typical tasks expected of an ultra-portable, but its 1.8GHz Turion isn't as potent as an equivalent Intel offering. We were more impressed by the 512MB of Ram, although 32MB of this is assigned to an onboard graphics adapter. As a note, the latter won't perform well with modern 3D games and failed to run 3Dmark 05. Evesham has equipped the Quest Explorer

with an 80GB hard drive – a large amount for a notebook of this type and, should you run out of room, the machine's dual-layer DVD drive comes in handy for backups.

We were most impressed by this notebook's battery life. It lasted two hours, 41 minutes.

The Quest Explorer doesn't quite live up to the standard set by equivalent Pentium-based notebooks, but if you sacrifice a little performance to save money, it's excellent value.

Rory Reid

DETAILS**RRP** £699 (£595 ex VAT)**BEST PRICE**www.pcw.co.uk/bestprices**PRODUCT INFORMATION**

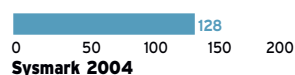
Evesham 0870 160 9500

www.lowestonweb.com**SPECIFICATIONS**

AMD Turion 64 Mobile Technology MT-34 (1.8GHz) • Windows XP Home • 512MB of Ram • 80GB 5,400rpm hard drive • 15in display (1,024 x 768) • Integrated graphics • DVD-RW Dual Layer • 802.11bg Wireless Lan • 2.9kg • 1mth access to Napster • MS Works 8 • E Trust Antivirus

PROS Price; storage options**CONS** Performance; not very light**VERDICT**

A cheap alternative to Pentium-based ultra-portables

FEATURES ★★★★★**PERFORMANCE** ★★★★★**VALUE FOR MONEY** ★★★★★**OVERALL** ★★★★★**PERFORMANCE****MEDIA CENTER PC****Hi-Grade DMS II 3400**

Bags of connectivity and features



Hi-Grade's DMS II 3400 follows on from the impressive DMS 3000 featured in our March group test.

A 3.4GHz Pentium 4 sits with 512MB of Ram, while a PCI Express Radeon X300 handles graphics. The latter is fine for all basic media and office tasks, but those who want to do more may need to consider an upgrade.

One of our biggest gripes about the last DMS was its paltry 120GB hard disk. Hi-Grade has supplied this new version with a 250GB model. It has also done a good job of keeping down noise levels.

The DMS II 3400 doesn't come with a monitor as standard and the Scart sockets featured on the previous version are gone – a real shame. When it comes to hooking up your TV or monitor, there are three options – DVI, analogue D-Sub and S-video. A dual analogue tuner lets you record two programmes at once, and Hi-Grade has left space for an internal digital tuner should you require one. The front of the case features a

dual-layer DVD burner, LED display, and a flip-down panel that reveals USB and Firewire ports, audio sockets, S-video and composite inputs and a multi-format card reader. The only real omission here is that the reader doesn't support XD Picturecards.

The DMS II 3400 is an expensive system, especially as you don't get a monitor, but with a wide range of connection options, compact design, fast processor and low noise levels, you get a lot for your money.

Will Stapley

DETAILS**RRP** £1,098.63 (£935 ex VAT)**BEST PRICE**www.pcw.co.uk/bestprices**PRODUCT INFORMATION**

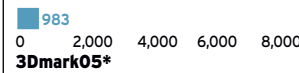
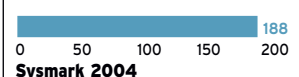
Hi-Grade 020 8532 6111

www.higrade.com**SPECIFICATIONS**

P4 3.4GHz • 512MB Ram • 250GB hard disk • ATI Radeon 128MB X300 • Dual layer DVD-RW • Inputs: 2x composite, 2x S-video, 2x phono audio, TV, FM • 2xVGA, DVI, s-video • Audio: 7.1 output, digital, coaxial • 4x USB2, 3x Firewire • 802.11g Wifi

PROS Connection options; very quiet**CONS** Expensive; retro design**VERDICT**

A quality Media Center system that's quiet and loaded with features – but it's quite pricey

FEATURES ★★★★★**PERFORMANCE** ★★★★★**VALUE FOR MONEY** ★★★★★**OVERALL** ★★★★★**PERFORMANCE**

* Tested at 1,024 x 768 in 32bit colour

CENTRINO NOTEBOOK

Samsung X25

Light and thin with fingerprint recognition



The idea behind Sonoma, Intel's latest version of Centrino, is that notebooks using it can offer more power while remaining both thin and light. Samsung's X25 doesn't disappoint. Despite a 1.86GHz Pentium M chip, an 80GB hard disk, 512MB of DDR Ram and a DVD writer, it weighs just 2.35kg and is just over an inch deep.

However, the X25 isn't spectacularly fast—it managed a Sysmark result of 143, with 1,240 in 3DMark2005 and 21fps in Far Cry.

Probably its most distinctive feature is the fingerprint reader, nestled between the two trackpad buttons. Once you've loaded the software you can log your passwords on the PC and access accounts (Windows, email, banking and so on) with the press of a finger.

The X25 is equipped with Intel Pro 802.11a, b and g Wifi, as well as Bluetooth, out of the box. It has more connectivity than you can shake a stick at—two USB2 ports on one side, a further one on the back, plus a

Firewire port and a PC card slot on the other side.

The back panel also houses the power connector and an S-video output. VGA, Gigabit Ethernet and modem ports are on the left, while headphone, microphone and memory card connections sit at the front.

There isn't much missing from Samsung's latest laptop. However, with older Centrino models available at nearly half the price, how much are you willing to pay for style and size?

Anthony Dhanendran

DETAILS

RRP £1,761.33 (£1,499 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Samsung 01932 455 000

www.samsung.co.uk

SPECIFICATIONS

Windows XP Professional • Pentium M 1.86GHz • 512MB PC3200 DDR Ram • 80GB hard disk • DVD-R/RW/+R/RW drive • ATI Mobility Radeon X600, 128Mb Ram • 15.1in TFT screen • Fingerprint scanner • 1 year warranty

PROS Thin and light; will connect to almost anything

CONS Expensive

VERDICT

Light and thin but you pay a hefty premium over comparative models for the privilege

FEATURES

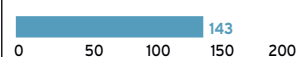
PERFORMANCE

VALUE FOR MONEY

OVERALL



PERFORMANCE



64BIT PENTIUM 4 PC

Mesh Elite Extreme PBX

Super-fast PC with amazing graphics



Mesh's latest is the first system we've seen that's powered by Intel's new Pentium 4 Extreme Edition 600 series processor, clocked at 3.73GHz.

The most exciting feature is its use of Extended Memory 64 Technology (EMT64), similar to the technology used by Athlon 64 processors, which lets it run 64bit programs as well as 32bit code. It blazed through our Sysmark tests, racking up a score of 244—more than the Dual Xeon-equipped Poweroid PC that once held the fastest PCW test score.

Graphics performance was also excellent thanks to an ATI Radeon X850 XT graphics card. And its 3DMark 2005 score of 9,254 is very impressive.

The Elite Extreme PBX's storage options are well-thought out. Mesh has supplied a pair 300GB Maxtor Diamondmax 10 hard drives in a Raid 0 (striped) configuration, which further aids performance. It also has a Sony dual-layer DVD rewriter, which can store up to 8.5GB of

data on compatible discs. We were slightly disappointed by the 19in Viewsonic VX912 TFT monitor supplied with this PC. It's an excellent display, but this PC can run games perfectly smoothly at 1,600 x 1,200 and above, so a 20in TFT or higher would have been preferable.

The Elite Extreme PBX has the potential to be even faster if used alongside the forthcoming 64bit edition of Windows. If you have the money, it could make you the envy of your friends.

Rory Reid

DETAILS

RRP £1,937.58 (£1,649 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Mesh Computers 0870 046 4747

www.meshcomputers.com

SPECIFICATIONS

Intel Pentium 4 Extreme Edition (3.73GHz) • 1GB of DDR2 400 Ram • 2x 300GB hard drives (Raid 0) • Radeon X850 XT PE • 19in Viewsonic VX912 monitor • Asus PSD2-E motherboard • 7-port USB hub • 8-in-1 card reader • Creative T7900 speakers • 1GB pen drive

PROS Very fast overall; good value

CONS 19in TFT; noisy

VERDICT

The fastest PC we've seen so far and it won't cost you the earth

FEATURES

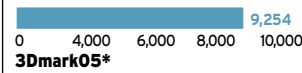
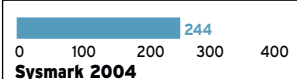
PERFORMANCE

VALUE FOR MONEY

OVERALL



PERFORMANCE



* Tested at 1,024 x 768 in 32bit colour

DIGITAL CAMERA

Canon Powershot A250

The successor to the A85 has arrived



If you caught our review of the Powershot A85 last year, you'll know we were suitably impressed. Now, less than a year on, Canon has decided to replace the A85 with the A520.

The first difference is in the design. While the new model looks very similar to the A85, the battery requirement has been halved to two AAs. As a result, the right-hand grip has been reduced in size and the weight has dropped by 70g to 230g. Canon has also ditched Compact Flash support in favour of the far smaller SD card.

The basic specs haven't changed a great deal. The A520 features a 4megapixel CCD, 1.8in LCD monitor and sensibly placed controls. The optical zoom has been boosted up to 4x, giving a 35mm equivalent focal length of 35-140mm and you get the same impressive range of automatic and manual controls. Thirteen preset shooting scenes are backed up by aperture and shutter priority, along with a full manual mode.

The A520 does have a few issues though, particularly when shooting in low light conditions – noise levels were reasonably high in our tests and the camera sometimes had trouble focusing.

Those who invested in a Powershot A85 last year shouldn't ditch it in favour

of this new version. There just aren't enough alterations to make it worthwhile.

Similarly, if you can find an A85 for sale cheaper than the A520, it's worth considering the older version and saving some money.

That said, if you're looking for a relatively cheap camera that houses a heap of features, takes good photos and is easy to use, we find it hard to believe you'll find a better model than the Powershot A520.

Will Stapley

DETAILS

RRP £239 (£203.40 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION Canon
08705 143 723 www.canon.co.uk

SPECIFICATIONS

2,272 x 1,704 max resolution • 4x optical zoom • 35-140mm focal length (35mm equivalent) • ISO 100-400 • 1.8in LCD monitor • SD card (16MB included) • 2 AA batteries • 91 x 64 x 38 (w x h x d) • 230g

PROS Loads of features; good photos

CONS Trouble shooting in low light

VERDICT

The perfect model for those who want a versatile and easy-to-use digicam without spending a fortune

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

HOME PROJECTOR

HP EP7112

Good quality but expensive



With high-definition TV looming on the horizon, a number of companies have started to realise that a good projector can offer a real alternative to expensive large-screen plasma TV sets. With that in mind, HP has released its new EP7112 Home Cinema Projector, which is aimed specifically at home users.

The projector's Barbarella-like design is certainly intended to attract the style-conscious. Its curvy plastic pod is a bit bulky, measuring 386 x 365 x 205mm, but only weighs 5.7kg, so it's not difficult to move it around and get it set up properly.

Image quality is very good, and the simple control panel on the projector's upper panel makes it easy to quickly adjust options such as aspect ratio, focus and zoom. There's also a small hand-held remote, so you can control the projector from the comfort of your sofa.

But, in order to concentrate on the home cinema market rather than business presentations, HP has consciously limited the number of input options. The projector has composite, component and S-Video sockets, but no DVI or VGA connectors. If you want to connect a PC you'll need to use some kind of converter, or an S-video output if your graphics card has one.

Given that a growing number of people are using their laptops or small, quiet computers such as the Mac Mini as part of their home entertainment set-up, this is a disappointing omission.

There is a more expensive model called the EP7122 which has a DVI interface, but this costs an extra £329. And, given that the EP7112 costs a not-inexpensive £999 we do feel that HP could have included a DVI interface as a standard feature.

Cliff Joseph

DETAILS

RRP £999 (£850 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION HP
0845 270 4142

www.hp.com/uk

SPECIFICATIONS

Digital light processing (DLP) projector • 800 x 600 maximum resolution • 840 (max) Ansi lumens • 210W lamp • 16:9 and 4:3 aspect ratios • Composite, component and S-video input • 5.7kg • 386 x 365 x 205mm (w x h x d) • Includes hand-held remote control

PROS Easy to set up and use

CONS No DVI or VGA interface

VERDICT

Provides good image quality, but at this price it should have a DVI interface

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

Waterproof gadgets

Technology and the outdoors used to mix about as well as fire and water, but nowadays there are plenty of gadgets ready to lend a hand to holiday-makers as they explore sand, wind and water this summer. So, whether you want to take your digital camera underwater during a spot of snorkelling, protect your mobile phone on the beach or be able to bring your mp3 player out for a jog when it's raining, we have some great products lined up.

Anna Lagerkvist



▲ Pentax Optio WP

Measuring just 22mm deep and sporting a 3x optical zoom and 5megapixel CCD, the Optio WP from Pentax is a good-looking digicam and totally waterproof. It can be plunged into 1.5m of water without the aid of an unwieldy waterproof case.

A total of 22 preset shooting modes are on offer to help the novice photographer, many focused on outdoor activities such as Surf & Snow, Firework and Underwater. Other features include a 2in LCD screen, 1cm macro mode and a red-eye compensation function, which enhances images after they've been taken.

Image quality is impressive, with good colour reproduction and crisp details, but low-light shooting exhibits a fair amount of noise.

The camera comes with a 10MB built-in memory, which isn't a lot if you take high-resolution images, so you'll need to buy an SD Card.

In short, The Optio WP is powerful, stylish and highly durable. A great investment for beach photographers this summer.

RRP £229.99 (£195.74 ex VAT)

PRODUCT INFORMATION

Pentax 01753 792 731 www.pentax.co.uk

PROS Waterproof; lightweight and compact

CONS Only waterproof up to 1.5m

★★★★★



▼ Panasonic Toughbook CF-18

For those who need to work in extreme conditions, Panasonic has developed the rugged and waterproof Toughbook. A variety of models and configurations is available and we looked at the 1.1GHz CF-18. It can operate as a standard notebook and, when the screen is swivelled round, it turns into a fully-functional Tablet PC. The 10.4in panel is small, but the TFT display is both clear and crisp.

The system has a tough magnesium alloy case and won't be affected by water, dust or the odd tumble. However, the function buttons, including the power button, are placed on the outside front of the machine just underneath the wrist rest, which means there is a risk of accidentally switching the machine on while transporting it.

Weighing just over 2kg and with a battery life of up to eight hours, it's ideal for mobile users and comes with 802.11g wireless connectivity.

All ports are watertight and covered by clip-on flaps, while the hard disk drive is enclosed in a damper that sits inside an aluminium case.

RRP £2,325.21 (£1,978.90 ex VAT)

PRODUCT INFORMATION

Panasonic 0870 010 0464 www.toughbook-europe.com

PROS Lightweight and robust

CONS Expensive

★★★★★



◀ Casio Exilim Zoom EX-Z50

Even with its waterproof case on, the Exilim Zoom EX-Z50 feels lighter and more comfortable to hold than the other models we've tested. The buttons at the back of the EWC-40 case respond well to touch and it offers a good grip both underwater and on land.

With 3x optical zoom and a 5megapixel resolution, the Exilim delivered crisp images. There are 23 scene modes and the 2.5in LCD screen makes it easy to review your photos or movie clips.

The case can be taken underwater up to 40m and has sand, dust and dirt resistance. The camera uses a rechargeable battery.

RRP Camera: £249.99 (£212.76 ex VAT)

Waterproof case: £189.99 (£161.69 ex VAT)

PRODUCT INFORMATION Casio 020 8208 7838 www.casio.co.uk

PROS Lightweight design; easy to use

CONS Case is expensive

★★★★★



Underwater shooting

Shooting underwater with any of the waterproof cameras reviewed here won't adversely affect quality. The water won't distort the photos and, as long as the waterproof case is clean, the standard of images should be exactly the same as when shooting on land. However, bear in mind that murky water conditions and small bits of floating debris will affect the quality of your photos no matter what camera you're using, especially if you've used a flash gun.

◀ Aquapac waterproof cases

Aquapac's waterproof cases are designed to protect your electronic devices as well as essentials such as your passport. Made from tough plastic, the cases are easy to carry, relatively cheap and can house devices such as mobile phones, notebooks, Ipods and PDAs, so you can bring them safely to the beach. An easy-to-use sealing system instantly waterproofs your valuables up to 5m and will keep sand and dust out. The cases have a three-year guarantee, offering further peace of mind.

The window on the camera and camcorder cases is clear, allowing for decent photos when tested underwater. When using a flash, we had to hold the camera tight to the case window to minimise reflection.

RRP Starting from £9.99 (£8.50 ex VAT)

PRODUCT INFORMATION Aquapac 020 7738 4466 www.aquapac.net

PROS Lightweight; multipurpose

CONS Slightly unstylish look

★★★★★

▶ Sealife Reefmaster DC310

The Reefmaster comes with a bright yellow rubberised case and grips to stop it slipping in your hands. It's waterproof up to 60m and has a 3megapixel lens and a 2x digital zoom; incredibly, there's no optical zoom feature. Both land and sea exposure modes are provided and you can shoot jpeg videos, but with just 8MB internal memory, you'll need a memory card if you want to take more than a couple of shots.

Open the casing and you find what feels like a cheap digital camera. You have to slide the lens cap open before inserting into the watertight case – annoying if you've forgotten to do it and just dived to 50m. Images turn out reasonably well, though we expected better.

The Reefmaster's clunky design lets it down – even on land the controls are difficult to operate. The on/off button for the LCD screen is in the way of the menu navigation button and it's impossible to switch between focusing modes when the camera is in the case.

The Reefmaster's 60m waterproof depth is impressive but the poor quality, fiddly controls and high asking price are enough to put us off.

RRP £359.99 (£306.37 ex VAT)

PRODUCT INFORMATION Sealife Cameras 0870 444 0003

www.sealife-cameras.com

PROS Robust case; 60m waterproof

CONS Very expensive; buttons are fiddly

★★★★★



◀ Fujifilm Finepix F810 Zoom

The Finepix F810 Zoom is a digital camera with an optional underwater case. A 6megapixel model, it has a 4x optical zoom, 2.1in LCD screen and can shoot images and movie files in 16:9 widescreen format. Advanced settings such as manual focus and exposure are built in.

The case is easily clipped onto the camera and lets you take it underwater up to 40m. The camera's function and menu buttons are manoeuvred using the large, brightly coloured controls at the back of the case. They are obviously designed to be easy to see and use, but we found them to be a little too large and awkward to operate smoothly.

RRP Camera: £329.99 (£284.84 ex VAT); Case: £149.99 (£127.65 ex VAT)

PRODUCT INFORMATION Fujifilm 020 7586 1477 www.fujifilm.co.uk/di

PROS Good quality camera

CONS Awkward buttons on waterproof case

★★★★★



▼ Oregon Scientific MP-120

Ideal for keen swimmers, the Oregon Scientific MP-120 is a slick mp3 player that can be plunged into water up to a depth of 1m for 30 minutes. It comes with waterproof headphones and is available in orange or black.

The MP-120 offers 10 hours of playback between battery charges (a full charge takes two to three hours) and its 128MB memory stores up to four hours of wma files or two hours of mp3s. Other features include a five preset equaliser, LCD display for track information and an FM radio with room for 30 presets.

The earphones take a while to get used to, but sound quality is decent – even underwater.

RRP £99.99 (£85.10 ex VAT)

PRODUCT INFORMATION Oregon Scientific 01628 580 154

www.oregonscientific.co.uk

PROS Versatile; robust

CONS Earphones are a little fiddly

★★★★★



▼ MSI Mega Player 521

Whether you're an athlete or not, running becomes more enjoyable when you can listen to music along the way. Being both robust and weather resistant, the MSI 521 is ideal to take out jogging or camping. Its memory capacity ranges from 128-512MB and both mp3 and wma formats are supported. There's also a built-in FM radio with 15 presets.

Sound quality is good and an equaliser lets you change settings to suit your musical preference. One disappointment is the bundled headphones – they look and feel cheap and have a tendency to fall off. For serious joggers, the device offers useful integrated functions such as a stopwatch, pedometer and calorie counter.

RRP £100.85 (£85.83 ex VAT) (512MB)

PRODUCT INFORMATION MSI 020 8813 6688 **www.msicomputer.co.uk**

PROS Good sound quality; sturdy

CONS Earphones; feel very cheap

★★★★★



▲ Suunto X9

Suunto's X9 wrist-top computer comes equipped with everything you need for a sporty weekend outdoors. Packed with useful functions such as a GPS, electronic compass, chronograph, altimeter and barometer, it will assist you through the toughest of situations and it's also water resistant to 90m.

Five buttons around the display control its functions and the menu is pretty straightforward and intuitive. You can apply the X9 to various outdoor activities and store information about good fishing spots, preferred campsites and other special places of interest in its memory.

The X9 has been created for serious hikers and those who need to plan their journeys in minute detail and are dependent on having the latest weather information constantly updated. That said, it's still fun to play around with, checking your exact location, the point of the compass or viewing the weather trend graphs, but unless you spend a lot of time in the wilderness it's a very expensive toy. It's also slightly difficult to operate when the device is on your wrist – we found that it's easier to take it off during operation.

RRP £500 (£425.53 ex VAT)

PRODUCT INFORMATION Suunto 01294 316 200 **www.suunto.com**

PROS Multitude of fun; useful functions

CONS Pricey; bulky design

★★★★★



▲ Nokia 5140

Nokia's 5140 handset manages to be rough and rugged yet stylish at the same time. It's designed to be both durable and water-resistant, so you can take it with you whether you are in the gym or on the beach.

The phone has many sports-related functions including an integrated digital compass, weather information and a fitness coach, which will keep track of your speed and performance. There's also an integrated camera and a flashlight. In addition, the 5140 is compatible with the emerging Push to Talk technology, a real-time VoIP-style service implemented over the GPRS network.

RRP £199.99 (£170.20 ex VAT)

PRODUCT INFORMATION Nokia 0870 055 5777 **www.nokia.co.uk**

PROS Durable and shock resistant

CONS Many features have little practical use

★★★★★

Additional waterproof gadget reviews from this test: Tivoli Audio Ipal www.pcw.co.uk/products/hardware/1162784; Bushnell 11-0013G outdoor camera www.pcw.co.uk/products/hardware/1162785



KONICA MINOLTA

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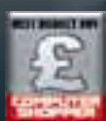
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DIGITAL CAMCORDER

Canon MV830i

Easy-to-use but let down by picture quality



The middle model in Canon's new MV800 camcorder range is small and convenient to use, although it doesn't have any particularly distinguishing outward features. Unfortunately the MV830i suffers from the now infamous bottom-loading tape mechanism issue, which is unlikely to bother many casual palm-wielding users, but will infuriate anyone using a tripod as cassettes cannot be loaded without removing the camera from its perch.

More convenient is the fact that the DV port supports input as well as output, so the camera can be used as a DV deck when editing on a PC. Its A/V output also works as an input, so video from analogue sources can be mastered to DV tape. Other useful features include a widescreen mode that captures footage in an anamorphic 16:9 image for playback on suitably shaped screens, as well as a handy night mode.

Those unfamiliar with camcorder operation will appreciate the inclusion of an automated Easy setting, although enthusiasts may find the lack of readily accessible manual controls something of a nuisance. And, despite the inclusion of a separate SD card for storing images and a mechanical shutter system, the MV830i is not particularly suited for still

photography, thanks to its low maximum image resolution of just 1,024 x 768 pixels.

We were less than impressed by the camera's overall video image. Even in bright outdoor lighting conditions, colours looked flat and washed out and detail was poor. We did address some of these quality issues by setting the white balance manually (which takes some rooting around in the menus to achieve), but were still unhappy with the picture generally.

Jonathan Parkyn

DETAILS

RRP £429 (£365.10 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Canon 08705 143 723

www.canon.co.uk

SPECIFICATIONS

MiniDV • 8MB SD memory card • 1x 1/6in CCD (800,000pixels) • 2.4in LCD screen • 20x optical, 400x digital zoom • 1,024 x 768 pixels • IEEE-1394 input/output • 51 x 130 x 93mm (w x d x h) • 430g

PROS Analogue and digital in/out ports; 16:9 widescreen mode

CONS Photo resolution; video quality

VERDICT

More suited to beginners than enthusiasts, poor image quality means it's hard to recommend

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL



MULTIMEDIA HARD DRIVE

Lacie Silverscreen

Portable hard disk which hooks up to a TV



Lacie's Silverscreen is a portable hard disk with a difference. As well as being an ultra-quiet external USB drive, it can play media files directly to a television. The 40GB version holds about 40 DivX movies, 10,000 songs or 40,000 pictures.

The drive comes pre-formatted with the Fat32 file system and getting your data onto it is as easy as dragging files into pre-defined folders. You can then entertain family and friends by hooking up the drive to a TV and selecting the file you want to play from an on-screen menu using the supplied remote control.

The Silverscreen is one of the first devices we've seen with an HDMI connector, which can output composite, S-video and component video together with audio. It can also output HDTV signals at up to 1080i. Only composite and S-video leads are supplied, but you do get a Scart adapter. There's also a digital audio output.

While the remote is sluggish, playback quality is good and the drive can handle a range of Mpeg1, 2 and 4-based files, include video-on-demand files from DivX.com. Audio support includes mp3, wav, wma and aac. However, a major let-down is that the Silverscreen can't play Quicktime or wmv files and doesn't support Apple's version

of aac used in iTunes. There's also a lack of any accompanying software; except for a freeware backup utility for Macs, all you get is a pdf of the manual. A utility for ripping DVDs or converting video between formats would have been an obvious choice.

The Silverscreen is incredibly easy to use but is let down by a few niggling omissions. However, once these are sorted out, this will certainly be a five-star product.

Chris Cain

DETAILS

RRP £164 (£139.57 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Lacie 020 7233 8338

www.lacie.com/uk

SPECIFICATIONS

USB2 • 40GB capacity • Avi, mpeg, mp3, wav, wma, aac, DivX and XviD support • HDMI video/audio output with composite, component and A-video • Scart adapter, AC adapter • Digital audio output • Silverkeeper backup (Mac only)

PROS Easy to use; HDTV support

CONS No Quicktime, wmv or iTunes aac support

VERDICT

A great idea let down by just a few flaws. Roll on version 2

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL



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PORTABLE HARD DISK

Seagate Pocket Hard Drive

Pill-shaped hard drive that fits in a pocket



Affordable USB-based flash memory devices have pretty much killed the floppy disc drive as a portable storage option. Now, this market has seen a new entrant in the form of portable hard disks – and Seagate's new Pocket Hard Drive really is very portable.

With the ergonomic feel of a handheld stopwatch, the Pocket Hard Drive is palm-sized and insubstantial enough to be comfortably deposited in a shirt or trouser pocket. The device's pill-shaped case is just 7cm in diameter and it weighs 63g – lighter than a chocolate bar.

Clever design means that a quick turn of the wrist retracts the Pocket Hard Drive's USB2 connector and cable completely into the rather-too-plasticky case. No external power supply is required, as the device draws current from the host computer. It's a neat and tidy gadget.

Though supplied with a suite of software utilities for partitioning and data write-protection and password security, none of these are required to operate the Pocket Hard Drive. Just connect it to a Windows XP/ME/2000/98SE or Mac OS9.2.2 or later computer and away you go. A centre-mounted blue light twinkles as data is transferred. Repeated copying of 1GB of mixed file types took an average of a little

more than nine minutes to complete. If your computer's Bios supports booting from USB, then the Pocket Hard Drive can be used as a boot drive.

While Seagate markets this as a 5GB drive your computer will accurately report the actual capacity to be 4.6GB. We'd also advise you to ignore Seagate's suggest selling price for the drive, as most retailers sensibly have: you'll have no problems buying the 5GB model for less than £90.

Scott Colvey

DETAILS

RRP 5.5GB model £139 (£118.30 ex VAT); 2.5GB model £119 (£101.28 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Seagate, 00800 4732 4283

www.seagate.com

SPECIFICATIONS

USB2, 5GB capacity (2.5GB model also available) • 3,600rpm drive speed

PROS Small and neat design; USB cable and socket both retract easily into case

CONS Cable is a little on the short side; case feels somewhat flimsy

VERDICT

Seagate has done a great design job here. A fantastic product

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL



SMARTPHONE

T-Mobile MDA Compact

Large-screen phone and PDA with Bluetooth



If you're looking for a mobile handset that's capable of more than just making calls and text messaging, T-Mobile's MDA Compact is worth serious consideration. It's one of the latest smartphones designed around Microsoft's Windows Mobile 2003 SE Phone Edition.

The first thing that strikes you about this handset is its size – the Compact looks minute alongside a standard Windows-based PDA.

Most of the device is occupied by a large touch-sensitive display that can be used in both portrait or landscape mode – ideal for viewing images or videos. There are four quick-launch buttons at the bottom of the handset, but most functions are accessed via the included stylus.

The MDA comes with Pocket versions of both Microsoft Excel and Word, and T-Mobile is currently offering the option to buy it with the Copilot Live GPS navigation system for an additional £150.

Unfortunately, the Windows Mobile operating system does make some things complicated. Simple tasks such as sending SMS messages are far from intuitive, and making calls can be tricky as there is no physical numerical keypad.

You may also find yourself accessing unwanted phone functions during calls as the side of your face makes contact with

the touch-sensitive display. Travellers will be pleased to note the MDA Compact is a tri-band phone, and can therefore be used in various countries, including the US. It is not 3G-compatible, but has Bluetooth and GPRS connectivity and can be upgraded to enable Wifi support via an SDIO slot.

If you're a business user who wants a device that ably combines a Pocket PC with a mobile phone, the MDA Compact is hard to beat.

Rory Reid

DETAILS

RRP £209.99 (£178.71 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

T-mobile 0800 956 5001

www.t-mobile.co.uk

SPECIFICATIONS

416MHz Intel PXA272 processor

• Windows Mobile 2003 SE

Phone Edition • 65,000 colour

TFT touch-screen, 208 x 320 pixels

• 64MB memory, supports SD cards,

SDIO • Bluetooth • Network:

GSM/GPRS

PROS Tri-band; Bluetooth; flexible

CONS Some functions could be simpler

VERDICT

A good all-in-one mobile phone and PDA

FEATURES

EASE OF USE

VALUE FOR MONEY

OVERALL

★★★★★

★★★★★

★★★★★

★★★★★



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Web : www.konicaminolta.co.uk/printer



Viewsonic VP191b

The newest member of Viewsonic's professional range of LCD monitors, the VP191b is specifically aimed at graphic designers, engineers and the financial sector. Launched in March with a 19in 16ms panel, it has already been updated with an 8ms response time.

In reality, this makes very little difference. Far more important are features such as a pivoting screen with super-slim bezel, crystal clear 1,280 x 1,024 image, strong colour and 170° viewing angle.

Viewsonic's on-screen menus are refreshingly straightforward and make setup easy, while a height and tilt adjustment lets you get the ideal position on your desk. Ours proved a little stiff but nothing to worry about.

The VP191 also stands out with three video inputs; two VGA sockets and a DVI-D connector. Picture quality on all three was excellent.

Chris Cain

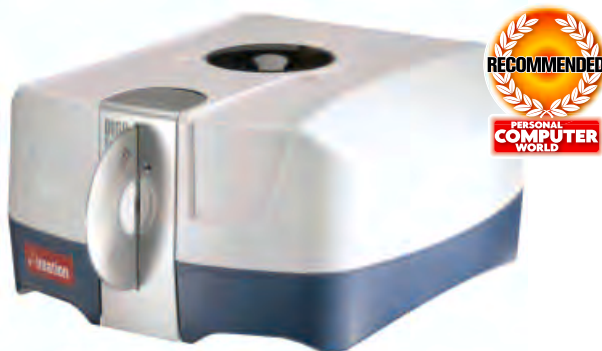
RRP £349 (£297.86 ex VAT)

PRODUCT INFORMATION www.lowestonweb.com

PROS Height adjustable; pivoting screen; three inputs

CONS No audio

★★★★★



Imation Disk Stakka

No matter how you store your CDs and DVDs, locating a particular disc or file can be difficult. Imation's Disk Stakka is a great solution that makes light work of storing and cataloguing almost any kind of 12cm optical media.

Although it may look a bit like a foot spa, it is in fact a motorised and stackable 100-disc carousel that connects to your PC or Mac via a USB1.1 connection. When you insert a disc into your system, the Opitracker database software detects it and catalogues the contents, then you simply slot the disc into the Disk Stakka unit for storage. Opitracker lets you search your entire collection for files and then automatically ejects your chosen disc for use. You can also browse your collection in Windows Explorer.

It's an incredibly easy way to tidy up your disc collection.

Kelvyn Taylor

RRP £99 (£84 ex VAT)

PRODUCT INFORMATION www.imation.co.uk

PROS Easy to use; good cataloguing software

CONS Discs need to be read on PC; only stores 12cm discs

★★★★★



Digital Cube I-Station

The 20GB I-Station from Digital Cube arrived too late to feature in our round-up of media players last month. It supports playback of DivX, Xvid and mpeg video files, along with a wide range of audio formats and boasts a built-in FM tuner and mp3 recorder.

Although the compact case is a little plasticky, the interface is clean and, thanks to the 3.5in touch-screen display and stylus, easy to navigate. In tests the I-Station coped extremely well with the various flavours of video thrown at it, but if you want to play wmv or asf files you'll need to use the included transcoding software.

While it doesn't have the advanced PVR features of the Archos AV400 (also available from Datamind) and can't record video, the I-Station impressed us a great deal with its playback compatibility.

Will Stapley

RRP £329.99 (£280.84 ex VAT)

PRODUCT INFORMATION

Datamind 0870 770 0848 www.datamind.co.uk

PROS Good compatibility; easy to use

CONS No video record feature

★★★★★



Fujitsu Handy Drive Data Edition 100GB

Weighing in at just 180g and boasting a 100GB capacity, Fujitsu's Handy Drive is an extremely portable 2.5in hard disk enclosed in a smart, brushed silver chassis.

Thanks to a USB2 connection, setting up is easy and the drive draws power from the host to cut down on the number of annoying leads. The 4200rpm disk comes pre-formatted in Fat32 to provide compatibility with both PCs and Macs, but can easily be reformatted. It's also whisper-quiet, something that can't be over valued.

While it's not suited for demanding tasks such as video editing, the Handy Drive is perfect for carting huge amounts of documents, photos and other data from place to place.

Our only issue is the price –there are much cheaper 3.5in portable drives available with more capacity.

Chris Cain

RRP £175 (£149 ex VAT)

PRODUCT INFORMATION Fujitsu 0870 242 7998 <http://uk.fujitsu.com>

PROS Capacity; virtually silent; portable

CONS A little expensive

★★★★★

POCKET PC**Asus My Pal A730W**

A fully-featured Pocket PC with Wifi



Asus has finally released a Wifi-enabled version of its A730 My Pal Pocket PC. Powered by a 520MHz XScale processor, this latest model has practically every feature you can pack into a PDA except perhaps a mobile phone: VGA screen, camera, 802.11b, Bluetooth, dual expansion slots, a USB host feature and even a replacement battery.

The clear 3.7in screen has a resolution of 640 x 480 pixels, which makes it ideal for viewing images you take with the integrated 1.3 megapixel Cmos camera, or watching movie clips.

The camera itself can take photos up to a maximum resolution of 1,280 x 960 pixels and comes with a flash in the form of a bright white LED, although this is really only good for illuminating close objects.

To make the most of the camera, Asus provides a suite of utilities. These include Asus Camcorder, Photo Viewer, Photo Editor and Photo Album.

The A730W boasts 128MB of Ram, double that of its predecessor, with 107MB available to the user, plus 64MB of flash Rom. Both expansion slots are located on the top of the unit – the SD slot supports SDIO, while a Compact Flash slot handles Type I and II cards. The system is powered by a

1.1mAh battery, which is a little on the small side for a PDA with a fast processor, wireless networking and big colour screen. A larger 1.8mAh battery is available as an option.

Another nice touch is the inclusion of a second 1.1mAh battery, but Asus has missed a trick with this – the spare battery can't be charged from the cradle. You have to swap batteries in and out of the unit to charge them, which is bothersome and a shame.

Simon Crisp

DETAILS**RRP** £365.78 (£311.30 ex VAT)**BEST PRICE**www.pcw.co.uk/bestprices**PRODUCT INFORMATION**www.asus.com**SPECIFICATIONS**

Windows Mobile 2003 • Intel 520MHz XScale • 128MB SD-Ram • 64MB Flash Rom • 3.7in VGA screen • 65,000 colours • 1.3megapixel camera • SD slot, Compact Flash slot • 802.11b, Bluetooth

PROS Fully featured PDA with large suite of utilities

CONS Spare battery can't be charged outside the unit. Existing battery could be more powerful

VERDICT

A fully loaded Pocket PC at a reasonable price

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

PENTIUM M MOTHERBOARD**Aopen i915Gm-HFS**

A good starting point for a quiet PC



When Aopen unveiled its first Pentium M motherboard, the i855GmE-LFS, the product quickly gained approval from people wanting to build a quiet, power conscious PC. But the fact it was based around a notebook chipset (Intel's i855) meant it lacked the performance and features of its desktop brethren. The latest member of the family, the i915Gm-HFS, is set to change all this by replacing the i855 with the much more capable i915GM/ICH6 desktop chipset combination.

Built using a Micro ATX design, the first thing you notice is how small the heatsink and fan are. If you are used to the huge coolers on normal desktop chips, you might worry whether the fan can keep anything cool but, not only does it work, it's practically silent.

The i915Gm-HFS is feature-packed, with support for DDR1 and 2 memory, x16 PCI-E and integrated graphics (with VGA and DVI/I outputs), dual Gigabit Lan and integrated 7.1 audio.

While the basic ICH6 Bridge doesn't support Raid, Aopen has added a Silicon Image controller that supports Raid 0 and 1 and the next-generation SATA II drives.

Performance-wise, the Sysmark04 score rose from 170 for the i855GmE-LFS to 180 for the i915Gm-HFS, while the 3Dmark05 score rose from 2,195 to 3,252 for the newer board.

The i915Gm-HFS makes good use of the combination of mobile processor and desktop chipset, but it's not cheap.

Simon Crisp

DETAILS**RRP** £175 (£148.93 ex VAT)**BEST PRICE**www.pcw.co.uk/bestprices**PRODUCT INFORMATION**[Dabs.com www.dabs.com/uk](http://www.dabs.com/uk)**SPECIFICATIONS**

Intel Pentium M • Intel i915GM chipset • 4 memory slots (2 DDR, 2 DDRII) • 116 PCI-E slot, 1x16 PCI-E slot • 2 PCI slots • 7.1 audio • 1 parallel slot • 4 serial slots (2 Raid 0, 1) • 8 USB (4 on rear panel, 4 by motherboard headers) • 2 Lan, 1 S-video, 1 VGA, 1 DVI/I, 1 YPbPr

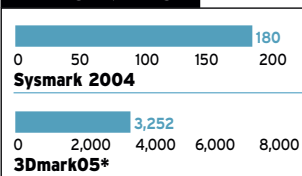
PROS Good set of features

CONS Price

VERDICT

If you're not on a budget and want to build a feature-rich, quiet PC then this would be a great place to start

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

PERFORMANCE

* Tested at 1,024 x 768 in 32bit colour

► Powercolor X850XT Platinum Edition

Powercolor's X850XT Platinum Edition is the latest graphics card to hit the PCW test bench, boasting the top-of-the-range Radeon processor.

Based on ATI's original reference design it features a 540MHz core clock, a 590MHz DDR (1.18GHz effective) memory clock and 256MB of DDR3 Ram, running through a 256bit memory bus.

One thing that has changed is the graphic on the cooling duct – ATI's standard image has been switched for a picture of a Mitsubishi Zero, nicely mirroring the bundled Pacific Fighters game from Ubisoft. A 3Dmark05 score of 6,071 and a Far Cry frame rate of 80fps (tested at 1,024 x 768) mean the card shouldn't struggle to get the best out of this or any other recent release.

The Powercolor also comes with Cyberlink's DVD Solution suite, which includes PowerDVD 5, Power Producer 2 Gold, Power Director 3.0SE+, Power2Go 3 and Mediashow 2.0SE

RRP £370.07 (£314.95 ex VAT)

PRODUCT INFORMATION Overclockers www.overclockers.co.uk

★★★★★



◄ Beantech Arc Platinum

When it comes to aluminium PC cases most people think of CoolerMaster or Lian Li, but more manufacturers are starting to offer interesting designs. The Platinum from Beantech is a prime example.

Part of the Arc range, this is a well-designed middle tower ATX case. Most of the chassis comprises 1.5mm depth aluminium, while the front panel is slightly thicker at 2mm.

The Platinum has all the features you would expect from a quality case; tool-free side panels and expansion plates (held by thumbscrews), tool-free drive mounts for the four 5.25in drives and one of the two 3.5in drive bays with external access. An added bonus is the removable motherboard back plate (again held by thumbscrews) and rubber drive mounts for the four internal 3.5in drive bays.

At first glance it appears there are no front ports, but two USB2 sockets and a single Firewire port are neatly placed on the side of the bottom section of the front bezel.

You don't get a power supply with the case but you do get three 8cm fans; two in the front and one in the rear panel.

RRP £85 (£72.34 ex VAT)

PRODUCT INFORMATION www.casestech.co.uk

★★★★★

► Seagate Barracuda 7200.8 (ST3400832A)

It wasn't so long ago that a 250GB hard drive seemed impossible to fill, but in these days of downloadable video and audio, it's fast becoming the minimum you need.

The latest addition to Seagate's Barracuda range is a whopping 400GB, available with both Pata (parallel ATA) (ST3400832A) and Sata (serial ATA) (ST3400832AS) interfaces.

The drive achieves its impressive capacity and speed by using three 133GB platters spinning at 7,200rpm and an 8MB cache, giving it a quoted average seek time of 8ms.

Seagate backs the drive with an impressive five-year guarantee.

RRP £186.96 (£159.12 ex VAT)

PRODUCT INFORMATION Dabs www.dabs.com

★★★★★



► Supanova Xion

Want a case that stands out from the crowd? The Supanova Xion may be just what you've been looking for. Constructed from steel the model we received had a black finish with six green LEDs in the front panel, forming a giant X. But if that doesn't take your fancy, the Xion is also available in silver.

Both the side panel and internal 3.5in drive cage are tool-free, with the latter holding up to three drives. There are also a further two 3.5in and four 5.25in external bays, while the front panel boasts two USB connectors and two audio ports.

The Xion comes with a 450w power supply and two fans installed; a 12cm fan in the rear panel and a green lit 8cm fan in the clear side-panel.

RRP £42.50 (£36.17 ex VAT)

PRODUCT INFORMATION DCS www.dcs-online.biz

★★★★★



► Asus CT-479 CPU upgrade kit

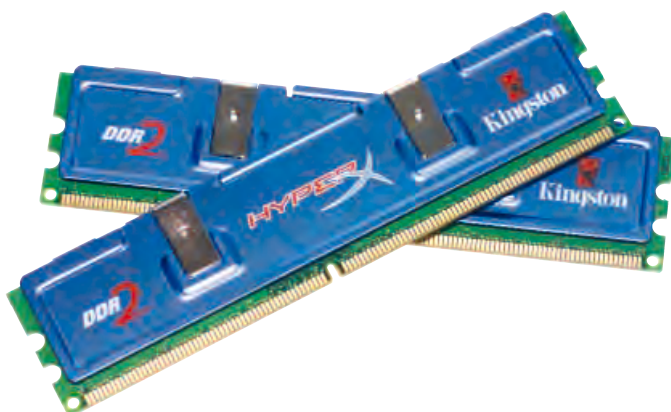
Originally designed for use in notebooks, Intel's Pentium M is also ideal for those who want to build a quiet desktop PC. Until very recently, however, compatible desktop motherboards have been based around Intel's i855GME chipset, which is limited in terms of features. Enter Asus with the CD-479 Upgrade Kit.

The CD-479 is an adaptor that lets you connect a Pentium M to more feature-rich Socket 478 boards. Unfortunately, it only works in a limited number of Asus products and doesn't support Intel's Speedstep technology, nor can you adjust the clock multiplier or the core voltage of the processor.

RRP £28.20 (£24 ex VAT)

PRODUCT INFORMATION Scan www.scan.co.uk

★★★★★



◀ Scythe Kamaboko Z

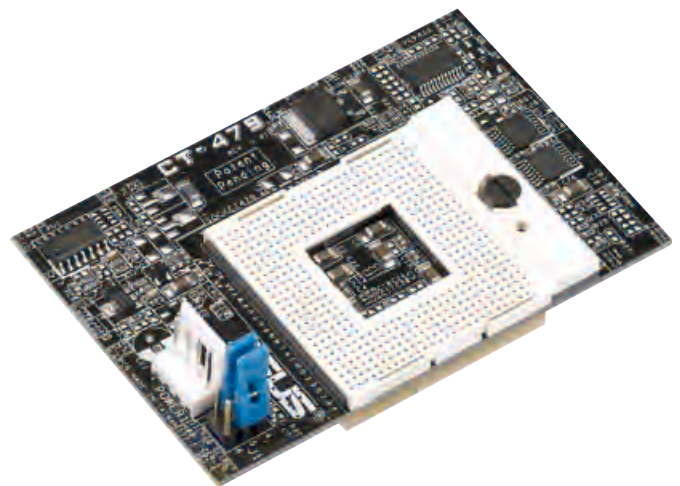
The oddly named Kamaboko Z is the latest CPU cooler from Scythe. Weighing in at 0.65kg it's a hefty piece of kit that's compatible with Sockets 775, 478, 754, 939 and 940.

To aid cooling the Kamaboko uses two copper heatpipes, which connect the top copper wave-stacked heatsink to the base. An additional aluminium heatsink is sandwiched between these. Sitting on top of everything is a large 92mm fan, which can be set to speeds from 1,000rpm (14dbA) to 3,200rpm (46dbA).

RRP £34.08 (£29 ex VAT)

PRODUCT INFORMATION Quiet PC www.quietpc.com

★★★★★



◀ Kingston DDR2 PC2-6000 memory

Kingston Technology has just added more DDR2 memory modules to its HyperX range. The unbuffered HyperX DDR2 750MHz (PC2-6000) memory modules are the fastest DDR2 memory currently available, with low latency timings of 4-4-4-12-1. Supplies will be limited and the pricing below is approximate.

RRP

KHX6000D2/256 256MB 750 MHz HyperX DDR2 Dimm £74.02 (£63 ex VAT);

KHX6000D2K2/512 512MB 750 MHz HyperX DDR2 Kit £148.05 (£126 ex VAT);

KHX6000D2/512 512MB 750 MHz HyperX DDR2 DIMM £130.42 (£111 ex VAT);

KHX6000D2K2/1G 1GB 750 MHz HyperX DDR2 Kit £233.82 (£199 ex VAT);

KHX6000D2/1G 1GB 750 MHz HyperX DDR2 DIMM £169.20 (£144 ex VAT);

KHX6000D2K2/2G 2GB 750 MHz HyperX DDR2 Kit £247.92 (£211 ex VAT)

PRODUCT INFORMATION Kingston www.kingston.com

★★★★★

DIGITAL MEDIA SUITE

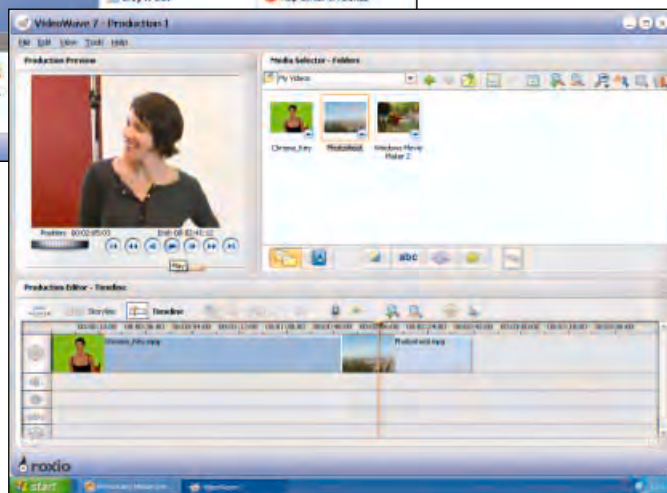
Roxio Easy Media Creator 7.5

A comprehensive suite of digital audio, video and photo-editing tools



Left: Easy Media Creator's Home Page lists all the separate programs included in the suite, as well as displaying a list of tasks that you can perform

Below: The suite includes several full-scale applications, including the popular Videowave video-editing program



The latest version of Easy Media Creator gets nil points for subtlety but a huge thumbs up for sheer value for money. Over the last few years, Roxio has taken over a number of its rivals and then, ironically, found itself being taken over by DVD specialists Sonic Solutions just a few months ago (although Sonic will continue to use the Roxio brand name, which is well known among PC and Mac users). Along the way, Roxio gathered up a motley assortment of digital media tools and it has chucked every one of them into this latest version of Easy Media Creator.

Describing Easy Media Creator 7.5 as a software suite is something of an understatement. It's more like buying yourself an entire library of software. Once you've installed it you'll find almost 20 new programs tucked inside the Programs section of your Start menu. These provide a wide range of tools for creating and editing digital audio, photos, video and DVD, as well as backing up and retrieving data.

To make it a bit easier to sort through all these different programs, Roxio provides you with a program called the 'Home Page', which acts as a kind of browser for all the tools and options that are available

within the suite. The Home Page lists these items in two ways. First, you can browse through a list of tasks arranged into categories, such as Music, Photos, or Video. So the Music category includes tasks such as converting audio CDs into mp3 format or burning your own music onto a blank CD, while the list of Photos tasks includes options such as creating a slideshow or emailing pictures to your friends.

Selecting a particular task will either open the relevant program – such as Photosuite for editing pictures – or will open a wizard linked to that program in order to guide you through the task one step at a time. This is a useful approach, as it caters to less experienced users who may be a bit confused by the sheer range of programs and features included in the Creator suite.

The Home Page also lists each of the programs within the suite

by name, so more experienced users can dive straight in and start working with whatever program they need.

One or two of these programs – such as Backup My PC – are also available separately and have recently been reviewed in PCW. And there's much more to get your teeth into here. For video work there's the popular Videowave editor (acquired from MGI in a previous round of takeovers), while DVD creation is handled by DVD Builder, based on Sonic's own MyDVD software. DVD creation has been enhanced in this version, with Roxio claiming speed increases of up to 30 per cent when compressing or copying DVD content. There's also a new program for converting DivX files into DVD, so you can download video from the Internet and put it onto a DVD disc that you can watch on any domestic DVD player.

There are a number of new audio features. The Audio Capture program can now be used to capture audio off the Internet and there's an LP and Tape Assistant that can be used to record music from a turntable or tape deck. This also provides useful information on how to connect your audio equipment to your PC. Finally, there are a few new diagnostic tools for testing the performance of your CD or DVD drive and a copy of Sonic's Cineplayer DVD player.

Roxio's everything including the kitchen sink approach may not appeal to everyone and there's a good chance you could buy the Creator suite and end up never using most of its features. But some of the programs in the suite, such as Videowave, were previously sold on their own for more than £50. That makes Easy Media Creator enormously good value for money and you could still be quids in even if you only ever use half of the features included here.

Cliff Joseph

DETAILS

RRP £69.99

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Roxio www.roxio.co.uk

SYSTEM REQUIREMENTS

Windows 2000 (Service Pack 4) or XP (Service Pack 1) • 500MHz processor for audio/video capture or 1.6GHz for DVD creation • 256MB of Ram • 1GB hard disk space • Optional DVD or CD burner

PROS Very wide range of audio, video, photo and DVD tools at an extremely competitive price

CONS You may never use many of the features in the suite

VERDICT

Excellent value, especially for people buying their first PC in need a complete suite of digital media tools

FEATURES

EASE OF USE

VALUE FOR MONEY

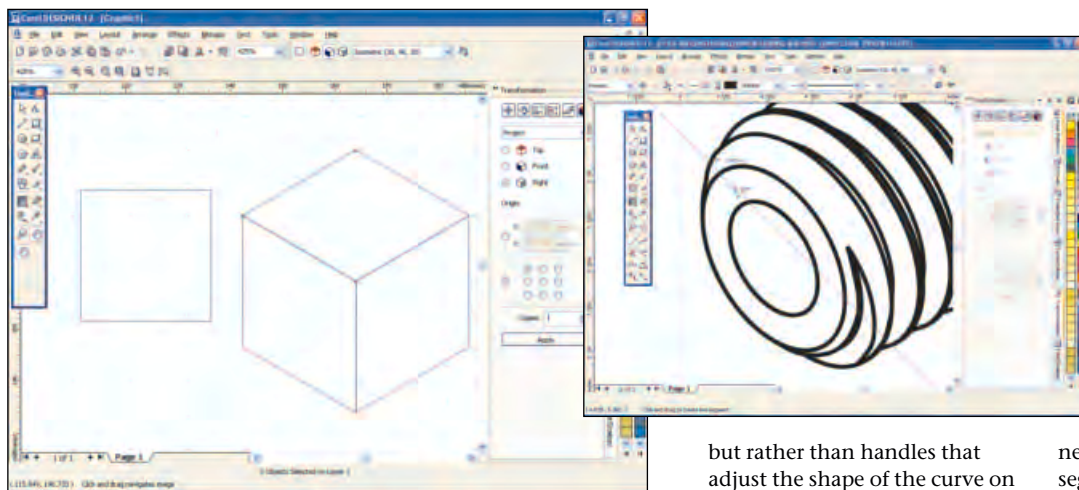
OVERALL



TECHNICAL ILLUSTRATION SOFTWARE

Corel Designer Technical 12

A feature-filled upgrade that will appeal to technical illustrators



Far left: Designer's new projected drawing modes simplify production of isometric and other 3D drawings

Left: Dynamic guides aid precise positioning of objects in relation to one another

When Corel acquired Micrografx and its technical drawing software, Designer, many thought the package would be quietly subsumed into the burgeoning Corel Draw. These suspicions appeared to be confirmed after a disappointing version 9, which added little to Designer's feature set and left the interface virtually unchanged.

Then Corel surprised everybody with Designer 10, a complete overhaul that changed the software almost beyond recognition. It introduced many new tools and features as well as a complete interface overhaul, much of it incorporating or based on the tried and tested technology that was already familiar to Corel Draw users.

Corel Designer Technical Suite 12 is a new upgrade, with features such as projected 3D drawing modes, dynamic guides, dimension lines and a new B-spline drawing tool.

In addition to the main application, the suite includes Corel Photo Paint 12, Corel Trace 12 (a bitmap to vector conversion utility), Corel's screengrab utility Corel Capture 12 and MS Visual Basic for Applications.

Designer 12's new projected drawing modes provide a number of editable presets that constrain drawing tools to

three angular planes for the production of 3D drawings. The presets define the relationship between the three drawing planes. Isometric, for example, places each plane at 30°, while Diametric puts them at 7°, 90° and 42°. In all there are 12 available presets, but you can edit these and create your own using the projected Axes docker.

Projected drawing modes are useful, but could go further. You can edit the drawing mode in the Transformation docker, but objects don't appear to maintain a relationship to the mode in which they were drawn and changing the mode without careful reference to the origin can produce unexpected results. You can, however, use the Transformation docker to produce all three sides of a 3D object from one orthogonal face.

Designer provides plenty of tools for creating shapes. Perfect shapes provides a multitude of basic shapes, arrows, flowchart and other commonly used shapes that can be edited easily. There's also a library containing more than 4,000 industry-standard symbols for architectural, electrical, mechanical and general use.

For objects you need to create from scratch, a new B-spline tool provides a way to create curved shapes. B-splines work in a similar way to Bezier curves,

but rather than handles that adjust the shape of the curve on either side of the node, B-spline points drag a curve as if anchored to either side of it.

Creating shapes from other shapes has long been one of Designer's strengths. Version 9 introduced features such as the Transformation docker, the virtual segment delete tool and the reflect nodes mode. This new edition enhances the Transformation docker with the ability to change 3D projection attributes and precision co-ordinate transformations.

A new Fillet/scallop/chamfer docker allows for the quick reshaping of object corners, producing rounded, inverse rounded and squared-off corners on any curve object.

Most of the remaining new features are aimed at making the job of precision drawing faster and easier – productivity enhancements, in other words. Dynamic guides are temporary guidelines that can be pulled from snap points to help you move, align and draw objects in relation to one another.

Vector-based hatch fills can be customised and are automatically transformed when used in projected modes. Enhanced line styles can be created with specific width and can be assigned patterns such as stitching effects. This feature has been developed in response to user feedback for clothing designers. There are also three

new types of dimension lines – segment, radial and diameter.

This package of new features and enhancements undoubtedly makes Designer a more capable application and will strengthen its appeal to technical illustrators. But aside from the new projected modes and the precision enhancements, this isn't a must-have upgrade for existing users. However, given the upheaval involved in the transition from version 9 to 10, this isn't necessarily a bad thing.

Ken McMahon

DETAILS

RRP £540.26 (£454 ex VAT)
(download)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Corel www.corel.co.uk

SYSTEM REQUIREMENTS

Windows 2000 or XP • Pentium III • 600MHz • 256MB of Ram • 1,024 x 768 graphics • CD-Rom • 700MB hard disk space • IE 6

PROS Close resemblance to Draw; support for wide range of formats

CONS Projected drawing modes lack flexibility; expensive

VERDICT

If technical illustration is all you do, Designer Technical suite offers a great range of tools and, due to its close relationship to Corel Draw, can double up as a general illustration application

FEATURES

★★★★★

EASE OF USE

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★

UTILITY SOFTWARE

Orlogix Wincleaner Complete PC Care

Everything you need to keep your PC running at full speed



Left: Many operations can be carried out direct from the CD, without the need for installation

Below: Wincleaner Startup Optimizer weeds out unnecessary programs that load at boot time. It tells you what each program does and lets you choose which ones to disable



Formerly known as Wincleaner Utility Suite, Complete PC Care is designed to give your system a thorough spring clean. It also provides a set of easy-to-use tools to protect you from malicious software, maintain your privacy and keep your system running as fast as the day you bought it.

Installation is very simple and a number of important functions can be used without installing anything at all. Many of the tools run directly from the CD, including the main One Click Cleanup. You can use this on as many PCs as you like, as it's only the installable tools that require separate licences.

During the scan, Cleanup seeks out items such as temporary and junk files, broken shortcuts, cookies and file and web history lists. Depending on how messy your system is, these operations alone can recover tens to hundreds of megabytes of hard disk space. Invalid Registry entries are also marked for deletion, followed by faulty start-up entries.

On completion you get an impressive list of items to be removed. You can now tell the package to either go ahead and delete them or abort the process. You don't get to select from a list of individual items – it's all or nothing. However, an

advanced options menu lets you customise which operations are run in future scans and you can also select any cookies or privacy items you want to keep by explicitly protecting them from the cleaning process.

This is about the right level of sophistication for novice or intermediate-level users but, if you're after full control over individual items in each category then you're out of luck. Once your hitlist of nasties has been compiled you can choose simple deletion or three levels of secure erasure, which will overwrite the files with random data up to military standard security.

Cleanup is just one of the 18 tools included in the suite and if this is enough for you it's available as a standalone product. The Complete PC Care suite adds many extra useful utilities, divided into three main categories: the Clean and Fix category includes the aforementioned One Click Cleanup, a disk error checker

and a handy utility for recovering accidentally deleted files and folders.

Under the Optimize section there's a 'Startup Items' optimiser that checks all the programs configured to run at system boot and suggests which ones could be removed, reducing your boot time and removing any unwanted and/or malicious items in the process.

A defragmenter is provided, designed to defragment specific files or folders rather than your entire disk. The 'Registry Optimizer' re-organises and cleans your system Registry, reducing its size and making it faster to access, while the 'Memory Optimizer' is a tool that runs in the background, periodically maximising the amount of free memory available to Windows.

Finally, the Secure and Protect section includes a full anti-virus program with a year of online updates included, as well as an Internet pop-up stopper, a

secure file eraser and a utility that monitors the health of your hard drives, warning you of any imminent failures or problems such as overheating.

One minor quibble is that, for a software suite as complex as this, printed documentation is limited to a brief quick-start guide. The individual tools are all very easy to use, but many are without adequate explanation. For example, you can boot from the install CD to run an anti-virus program designed to help you recover your PC from an attack, but this isn't mentioned anywhere in the quick-start guide or built-in help.

The most important aspect of this software suite is that it works. It's all very well displaying status reports festooned with impressive statistics boasting huge amounts of junk removed and problems resolved, but when you've finished cleaning and reboot your system to find it running significantly faster, you know some serious housework has taken place.

Paul Monckton

DETAILS

RRP £34.99 (£29.78 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Orlogix

00800 3883 2000

www.orlogix.com

SYSTEM REQUIREMENTS

Windows 95/98/ME/NT/2000/XP •

Internet Explorer 5 or higher • 64MB

of Ram • 35MB hard disk space •

CD-Rom drive • 16bit graphics card

PROS It's simple to use and it works

CONS Lacks detailed documentation; some duplication of features

VERDICT

If your system is running slower than it should – Wincleaner Complete PC Care will do a good job of restoring performance and protecting your privacy

FEATURES

EASE OF USE

VALUE FOR MONEY

OVERALL

★★★★★

★★★★★

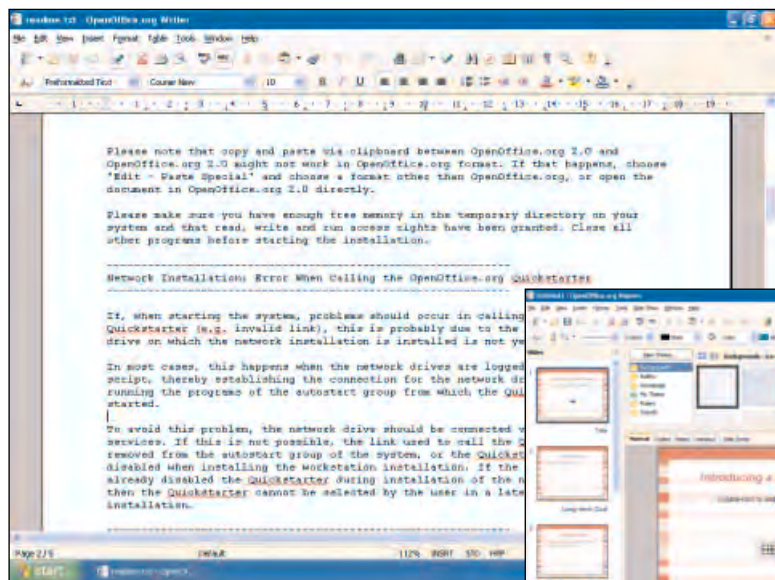
★★★★★

★★★★★

OFFICE SUITE

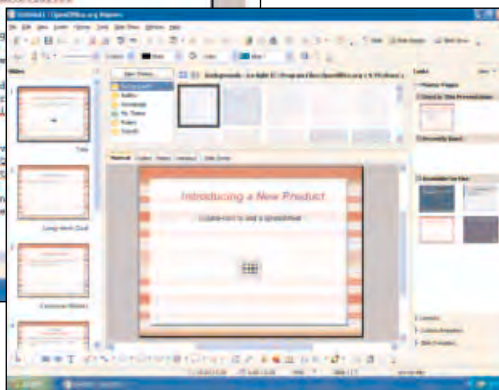
Openoffice.org 2

A new, improved version that gives Microsoft a run for its money



Left: The Write word processor looks and feels just like Microsoft Word

Below: For presentations, the Impress program provides a wide range of templates and animation effects



Strictly speaking, the installer program for Openoffice 2 says it's version 1.9.79 – but what's 0.0.21 of an upgrade between friends? We're more concerned about the daft decision to tack '.org' onto the end of the name.

But that's by the by. As you may already know, Openoffice is the open source suite of business applications that's gradually gaining wider acceptance as an alternative to Microsoft Office (just as Linux is an alternative to the Windows operating system).

The business software market is still strongly dominated by Microsoft, of course, so this upgrade concentrates on improving compatibility with Office documents and making existing Office users feel more comfortable about switching.

The main programs are Writer (word processing), Calc (spreadsheet) and Impress (presentations) and they look and feel much like Word, Excel and Powerpoint. They now have more flexible toolbars that can be rearranged to customise the workspace. There's improved support for Microsoft's XML file formats, plus the suite has a new default XML format called Opendocument. All this talk of

XML may sound rather obscure, but support for this is increasingly important for large corporations. In addition, the Opendocument format is the official European Union XML format. Supporting it means that Openoffice can be used by EU departments themselves and also by companies that supply products or services to the EU.

Moving on to the individual programs, the similarities between Writer and Word are striking and Writer now includes features that are directly comparable to Word. One example is Customshapes, which mimics Autoshapes. These are vector graphics objects, such as stars and arrowheads, which you can add to your documents to create diagrams or flowcharts. As well as being a useful addition, Customshapes are compatible with Autoshapes, which means you can now import Word documents that contain Autoshapes into Writer.

Writer is also now better at importing Word documents that contain tables and its own table tools have been improved, allowing you to create 'nested' tables by inserting small tables

within the cells of an existing one. And Writer has added some features of its own, such as text frames that can be set to automatically shrink or grow as you alter the text within them.

The Calc spreadsheet hasn't been changed drastically but it does have a few important new features. The Excel export filters have been improved and Calc can now handle spreadsheets containing up to 65,536 rows – the same as its rival. There's also a new filter called the Datapilot, which is similar to Excel's Pivottable data analysis tool.

There aren't many changes to the Impress presentation program, but there are major improvements to the suite's database tools. Previous versions of Openoffice did have some powerful database features but you needed to be proficient with databases and SQL programming to get anywhere with them. This aspect of the suite has been completely reworked, with the inclusion of a new database program called Base. This can be used to create database files, reports and queries, just like Access, Filemaker or any other

conventional database. There's even a wizard to help new users get started with creating and managing their databases. The only minor drawback here is that Base is Java-based, so you'll need to make sure you have a 'Java run-time environment' (JRE) installed on your PC before you can use it.

Admittedly, Openoffice still can't match the vast range and depth of features found in Microsoft Office, but as Microsoft itself often says, 80 per cent of Office users only use 20 per cent of its features. With that in mind, there's no doubt version 2 is more than powerful enough for most home and business users and can certainly give Microsoft a run for its money – especially since it's free. And for corporate users who need proper technical support (which isn't available with the free version), there's a retail version of the suite called Star Office (www.staroffice.com). This costs \$50 (£26.26 approx) and is supplied and supported by Sun Microsystems.

Cliff Joseph

DETAILS

RRP Free download

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

OpenOffice.org

www.openoffice.org

SYSTEM REQUIREMENTS

Windows 98 or later • 200MHz processor • 128MB of Ram • 200MB disk space

PROS Completely free business applications suite, including word processor, spreadsheet, presentations and database
CONS No technical support; scrappy documentation

VERDICT

New features and improved compatibility with Microsoft Office make this a genuine alternative for many home and business users

FEATURES

EASE OF USE

VALUE FOR MONEY

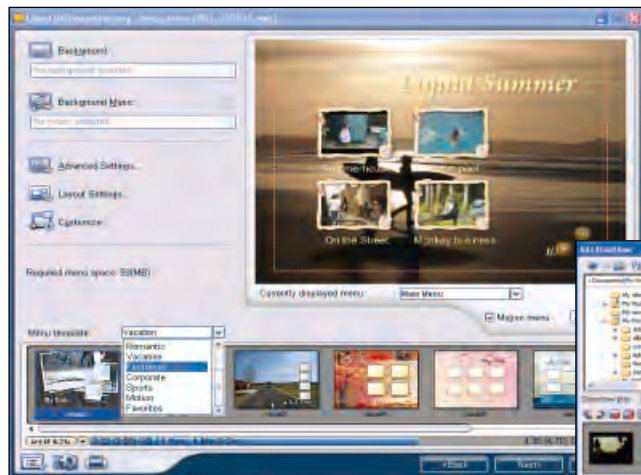
OVERALL

★★★★★
★★★★★
★★★★★
★★★★★

DVD AUTHORIZING

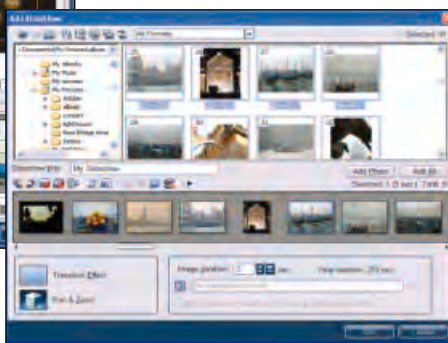
Ulead DVD Movie Factory 4

Great value with advanced editing features – a good choice for home users



Left: Lots of menu templates are included, all offering a high degree of customisation

Below: Good slide show tools now include pan and zoom animation



Most budget video-editing programs now provide some DVD authoring tools, so dedicated authoring applications need to offer something extra. Ulead's DVD Movie Factory 4 offers ease of use and the ability to get video from a variety of sources – files from your hard drive, camcorder footage and digital TV recordings – onto your discs with the minimum of fuss.

Movie Factory uses a tabbed, wizard-style interface, which guides you through the DVD production process. First, a launch screen presents the various project options, which include Create Video DVD, Create Slideshow DVD, Copy disc, Straight to Disc and Edit DVD. Similar options are provided for CD-based projects.

As well as producing standalone slideshows, the package lets you incorporate them within a DVD-video project. Movie Factory's tools for assembling shows – sorting images, adding transitions and arranging backing music – were always good. This version adds new pan and zoom effects so that even still images can be given a more dynamic feel.

Straight to Disc is perfect for instant archival of a DV tape. All you need to do is connect your camcorder with a Firewire cable, insert a blank or editable DVD in

the drive and hit the button. It's just a shame that this new version's support for 16:9 widescreen format video doesn't extend to this feature. If you have a camcorder capable of shooting in 16:9 format, you'll have to capture and author manually.

Convenient as Straight to Disc is, most people will opt for the more hands-on approach. The first step here is to import your source clips by capturing from a DV camcorder or analogue TV tuner or by locating files on your hard drive. Captured footage can be encoded on the fly – this saves you having to do it later, prior to DVD burning – and the mpeg2 encoding options have been expanded, with new quality presets, 16:9 formats and Dolby Digital Stereo audio encoding.

It's not up to the standards of a dedicated video editor, but Movie Factory has all the basic tools for editing and organising clips into a format for DVD viewing.

The Multi-trim window makes light work of cutting unwanted footage, allowing you to scan through a clip using VCR-style controls and a jog slider, marking sections of the clip you want to keep and discarding the rest.

The add/edit chapter feature is used to add chapter points to longer clips and create sub-menus for them. You can add chapters

manually – a preview window, VCR-style controls and a jog wheel let you skip through a clip adding chapters as you go. You can either create chapter points at fixed time intervals or where Movie Factory automatically detects scene changes.

The Enhance video feature lets you add transitions between clips, superimpose title overlays and record and mix voiceover narration and background music tracks. These features make the program a good choice for those who don't own a video-editing application but still want some creative editing control.

Having organised and edited your content, Movie Factory's menu editor puts it into a default template, with thumbnails to link clips to chapter menus and navigation buttons to move between menu pages. A selection of templates is organised into categories such as corporate, vacation, festivities and romantic. If these aren't to your liking, they are easily customised. Changing the background image or video, customising the thumbnail buttons and adding menu background music takes seconds. You can now drag and resize elements in the menu preview and templates

customised in this way can be saved and re-applied to subsequent projects with a click.

Prior to burning, a built-in software player fulfils a preview and testing role. As playing motion menus (thumbnail buttons and backgrounds that use video loops) can put a strain on all but the fastest systems, this option can be disabled.

Burning options are more than adequate; you can record straight to disc in standard DVD-video format, Ulead's fast re-editable format, or DVD+VR. Alternatively, you can burn the files to a folder on your hard disk or create a disc image from which multiple copies can be produced. There's also support for dual-layer DVD recording.

At £24.99, DVD Movie Factory 4 is the best value for money DVD authoring application out there. But for existing users it's not a compelling upgrade; many changes are cosmetic and unless your camcorder can shoot 16:9 or you've just invested in a dual-layer burner, you could probably live without the new features.

Ken McMahon

DETAILS

RRP £24.99 (£21.27 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Ulead www.ulead.co.uk

SYSTEM REQUIREMENTS

800MHz Pentium III • 128MB of Ram •

Windows 98SE/ME/2000/XP •

950MB free hard disk space • DirectX

9, Macromedia Flash Player 7, IE6

PROS Easy to use; dual layer;

16:9 support

CONS Not a big step forward

from version 3

VERDICT

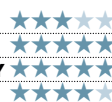
A great choice for home users looking for ease of use, matched with some advanced editing features

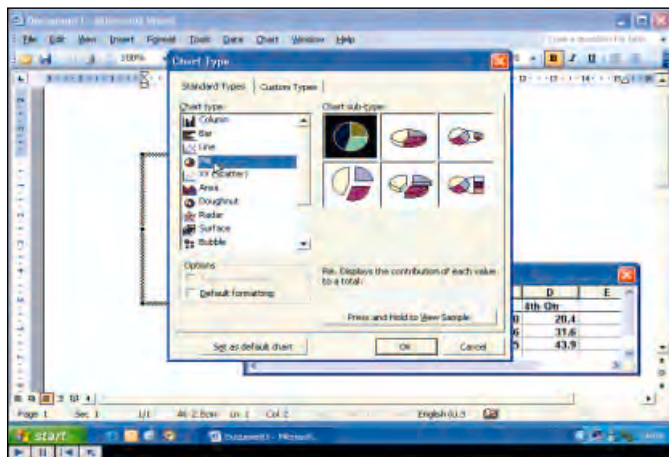
FEATURES

EASE OF USE

VALUE FOR MONEY

OVERALL





Office Tutorial Compendium Pack

GSP's Compendium Pack is aimed at the PC novice and combines all six of its Windows and Office tutorials in a single box. There's advice on using XP Home, a step-by-step guide to the Internet, plus tips on the latest versions of Word, Powerpoint, Excel and Access.

While some information is a little out of date (for example, the XP disc covers Media Player 8 and SP1), the tutorials and demonstration movies are easy to follow. GSP's approach beats wading through online help files, and we even learned some new tricks in Word. That said, it's a pretty passive experience.

Chris Cain

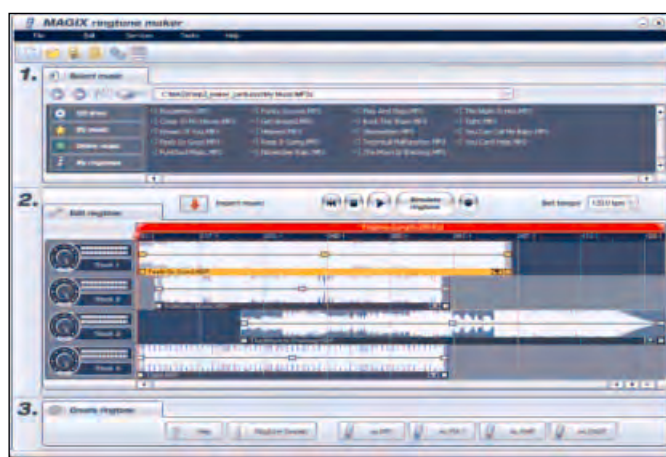
RRP £29.99 (£25.52 ex VAT)

PRODUCT INFORMATION GSP 01480 496666 www.gsp.cc

PROS Great for beginners, excellent value

CONS Some information now out of date

★★★★★



MP3 Ringtone Maker

MP3 Ringtone Maker is the latest addition to the Fasttrak audio software family. It can turn unprotected mp3 files, songs from an audio CD or tracks from the Magix Online Content Library into ringtones for your mobile phone.

The program is easy to use and flexible. Up to four mp3 tracks can be used in any single ringtone and you can customise each track. You'll need to use your phone's own connection software to transfer your creations to your handset. If you regularly download ringtones, MP3 Ringtone Maker can undoubtedly save you money.

Rory Reid

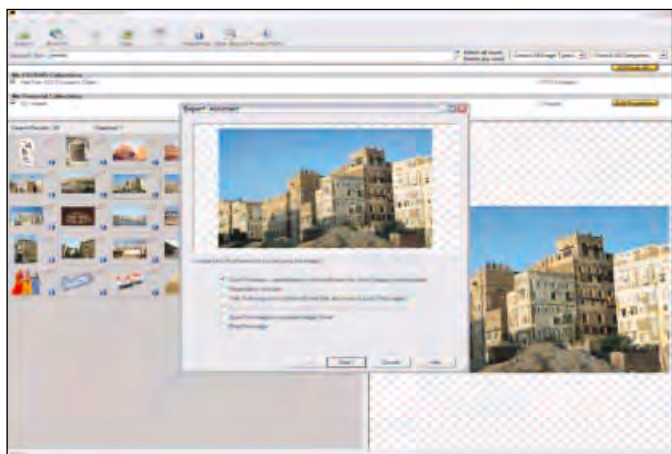
RRP £19.99 (£17.01 ex VAT)

PRODUCT INFORMATION Fasttrak 01923 495 496 www.fasttrak.co.uk

PROS Can save you money

CONS No direct-to-mobile transfer

★★★★★



Mammoth 800,000 Clip Art

Clip art junkies need look no further – if 17GB of royalty-free photos, vector graphics, web graphics and illustrations isn't enough to satisfy you, we're at a loss to suggest something more suitable.

Supplied on two dual-layer DVDs, the collection comes with its own browser for most of the content – confusingly, the web graphics don't appear in this application and have their own separate HTML index on the second disc. The catalogue application is a bit clunky, but has some useful features, such as the Export Assistant that converts pictures for specific uses such as email or presentations.

Kelvyn Taylor

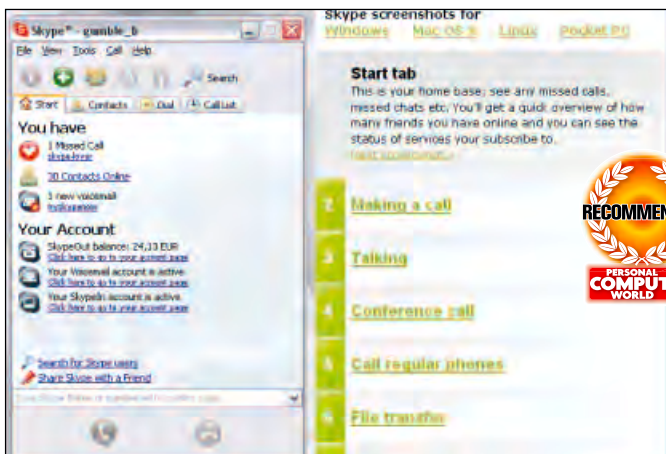
RRP £29.99 (£25.52 ex VAT)

PRODUCT INFORMATION Fasttrak 01923 495 496 www.fasttrak.co.uk

PROS Massive amount of content; useful catalogue application

CONS Slow searching; web graphics in separate index

★★★★★



Skype

Voice over IP is growing quickly and Skype is one of the most popular services you can use to make free or low-cost calls via the net.

Previously, only other Skype users could contact you via the service, but v1.2.0.48 adds an optional Skype In phone number and voicemail for €11.50 a quarter (£8 approx). This is a little expensive, but it does make Skype attractive, especially to businesses. The cost for making calls to normal PSTN phone lines is competitive, but where Skype wins is its simplicity to set up and use. Call clarity is good, it comes with a conference function and you can send instant messages.

Rob Jones

RRP Free

PRODUCT INFORMATION Skype www.skype.com

PROS Easy to use; free or cheap calls; conference function

CONS Optional Skype In a little expensive

★★★★★

Best Buys



YOUR GUIDE TO TODAY'S TOP PRODUCTS >>

HIGH-END PC

Mesh Elite Extreme PBX

REVIEW July 2005, p56 RRP £1,937.58

(£1,649 ex VAT) **PRODUCT INFORMATION**

Mesh 0870 04604747 www.meshcomputers.com



The most powerful system we've seen, thanks mainly to its use of a P4 Extreme Edition 600 series processor clocked at 3.73GHz. It also features a Radeon X850XT and whopping 600GB of storage space.

PC BUNDLE

Jal Tacita

REVIEW July 2005, p124 RRP £999

(£850.21 ex VAT) **PRODUCT INFORMATION**

Jal 08707 525 810 www.jal.co.uk



This Jal features an Athlon 64 3200+, 1GB of Ram and an Nvidia Geforce 6600GT graphics card. It also sports an Avermedia digital TV tuner card and an Epson Stylus Photo R200 printer. A real bargain.

MEDIA CENTER PC

Evesham E-box S

REVIEW March 2005, p103 RRP £999

(£850.21 ex VAT) **PRODUCT INFORMATION**

Evesham 0870 160 9500 www.evesham.com



A refined version of the previous Evesham E-box, this features dual digital TV tuners, a quieter cooling system and a stylish design. At under £1,000, it's one of the best Media Center PCs currently available.

BUSINESS NOTEBOOK

Acer Travelmate 8104 WLMI

REVIEW June 2005, p104 RRP £1,499

(£1,276 ex VAT) **PRODUCT INFORMATION**

Acer 0870 900 2237 www.acer.co.uk



With a 2GHz Pentium M and 1GB of Ram, this Travelmate provides excellent performance, portability and usability. It's designed primarily for business, but has no trouble attracting home users.

SONOMA NOTEBOOK

Evesham Voyager C510

REVIEW May 2005, p54 RRP £1,173.83

(£999 ex VAT) **PRODUCT INFORMATION**

Evesham 0870 160 9500 www.evesham.com



This is the fastest Sonoma notebook we've seen and it blazed through our benchmarks. If you want a portable PC that lets you play the latest 3D games, this Evesham is well worth the money.

TABLET PC

AJP T200C

REVIEW August 2004, p48 RRP £1,173.82

(£999 ex VAT) **PRODUCT INFORMATION**

AJP 020 8208 9700 www.ajp.co.uk



The T200C is a convertible notebook combining the features of a traditional laptop with the flexibility of a tablet PC. It includes a digital camera, DVD rewriter and costs just £999 ex VAT.

PROJECTOR

Infocus X2

REVIEW September 2004, p51 RRP £799

(£680 ex VAT) **PRODUCT INFORMATION**

Infocus 08000 286 470 www.infocus.com



It might be a bit on the heavy side, but considering the price tag of just £799, the Infocus X2 impressed us a great deal. Colours were well represented and text was superbly crisp.

PORTABLE MEDIA PLAYER

Archos AV400

REVIEW June 2005, p54 RRP £314.99

(£268.07 ex VAT) **PRODUCT INFORMATION**

Datamind 0870 770 0848 www.datamind.co.uk



Capable of playing back all manner of video and audio formats, the AV400 from Archos is also able to record video and audio directly as well as function as a fully-fledged personal video recorder.

19IN FLAT-PANEL MONITOR

Viewsonic VP191b

REVIEW July 2005, p68 RRP £349

(£297.86 ex VAT) **PRODUCT INFORMATION**

Lowest On Web www.lowestonweb.com



The 19in VP191b features a pivoting screen with super-slim bezel, crystal clear 1,280 x 1,024 image, strong colour and impressive 170-degree viewing angle. The only omission is a set of internal speakers.

PDA

Palmone Zire 72

REVIEW September 2004, p106 **RRP** £199

(£170 ex VAT) **PRODUCT INFORMATION**

Palmone 0118 974 2700 www.palmone.com/uk



We weren't expecting much from the Zire 72, but were pleasantly surprised by its excellent picture quality, the 1.2megapixel camera and great performance.

POCKET PC

T-Mobile MDA Compact

REVIEW July 2005, p67 **RRP** £209.99

(£178.71 ex VAT) **PRODUCT INFORMATION**

T-Mobile 0800 956 5001 www.t-mobile.co.uk



The MDA Compact offers an extra-large screen, Bluetooth connectivity and comes with Pocket versions of popular Microsoft products. A great Pocket PC and mobile phone package.

MULTIFUNCTION DEVICE

Brother DCP-310CN

REVIEW February 2005, p54 **RRP** £119.99

(£102.12 ex VAT) **PRODUCT INFORMATION**

Brother 0870 830 4037 www.brother.co.uk



Although print quality isn't the best we've seen, the DCP-310CN is a good compact all-in-one unit, has the added benefit of being able to hook up to a network and comes at a decent price.

MP3 PLAYER

Apple iPod

REVIEW January 2005, p129 **RRP** £207.99

(£176.17 ex VAT) **PRODUCT INFORMATION**

Apple 0800 039 1010 www.apple.com



Easy to use and undeniably stylish, the iPod sets the standard which all other mp3 players follow. Available in a variety of storage options, the only factor that lets it down is battery life.

LASER PRINTER

HP Laserjet 1320nw

REVIEW January 2005, p66 **RRP** £368.95

(£314 ex VAT) **PRODUCT INFORMATION**

HP 0845 270 4222 www.hp.com



There are cheaper personal printers, but with excellent build quality, top performance and wireless support, the 1320nw impressed us a great deal. It comes with a duplex feature as standard.

INKJET PRINTER

Canon Pixma IP5000

REVIEW June 2005, p60 **RRP** £169

(£143.83 ex VAT) **PRODUCT INFORMATION**

Canon 08705 143 723 www.canon.co.uk



The new Pixma IP5000 fires out 1picolitre drops of ink, enabling it to reach new levels of detail. It takes just 35 seconds to print a 6 x 4 photo and, thanks to an extra black ink, they look great too.

MOTHERBOARD

ECS 915-A

REVIEW June 2005, p70 **RRP** £61.81

(£52.50 ex VAT) **PRODUCT INFORMATION**

ECS 0870 4000 111 www.directfrom.com



The Intel-based 915-A offers three types of graphics: integrated, AGP and PCI-Express. The board is well designed and allows for a wide range of upgrades. At just £61, it's a real bargain.

HIGH-END SPEAKERS

Creative Gigaworks S750

REVIEW April 2004, p48 **RRP** £330

(£280.77 ex VAT) **PRODUCT INFORMATION**

Creative www.creative.com



Coming with a wireless remote control, 210w sub-woofer and seven satellites at 70w each, these THX-certified speakers from Creative can completely immerse you in sound.

SOUNDCARD

Creative Audigy 4 Pro

REVIEW July 2005, p110 **RRP** £179.99

(£153.18 ex VAT) **PRODUCT INFORMATION**

Creative <http://europe.creative.com>



The Audigy 4 Pro is an upgrade of the impressive Audigy 2 series. The main difference is the new digital to audio converters, which provide a better signal to noise ratio. The price reflects the quality.

KEYBOARD AND MOUSE

Microsoft Optical Comfort Edition

REVIEW April 2005, p74 **RRP** £79.99 (£68.07 ex VAT)

PRODUCT INFORMATION Microsoft 0870 601 0100

www.microsoft.com/uk



This wireless keyboard from Microsoft has a comfortable ergonomic design and comes with a quick-zoom control and an impressive wireless optical mouse.

POWER SUPPLY

Antec Phantom 350w

REVIEW March 2004, p74 **RRP** £117.44

(£99 ex VAT) **PRODUCT INFORMATION** Overclockers

www.overclockers.co.uk



The Phantom 350w's build quality is second to none. Constructed with aluminium heatsinks and not a single fan in sight, this 350w power supply would be ideal for a home theatre PC.

GRAPHICS CARD

Powercolor X850XT Platinum Edition

REVIEW July 2005, p70 **RRP** £370.07

(£314.95 ex VAT) **PRODUCT INFORMATION**

Overclockers www.overclockers.co.uk



This ATI card features a 540MHz core clock, 590MHz DDR memory clock and 256MB of DDR3 Ram running through a 256bit memory bus. In short, it's one of the fastest cards around.

DIGITAL VIDEO CAMERA

Sony Handycam DCR-HC1000E

REVIEW November 2004, p68 **RRP** £1,300

(£1,106.38 ex VAT) **PRODUCT INFORMATION**

Sony 08705 111999 www.sony.co.uk



If your budget can stretch to £1,300, this is a great camcorder. Not only are its three CCD sensors capable of capturing stunning footage, but it's also very easy to use. Expensive, but well worth the money.

DIGITAL CAMERA

Canon Powershot A85

REVIEW December 2004, p64 **RRP** £239

(£203.40 ex VAT) **PRODUCT INFORMATION**

Canon 0870 514 3723 www.canon.co.uk



Not only can the Powershot A85 take decent 4megapixel images, but it also comes with a wealth of manual controls, as well as a 3x optical zoom and a 32MB Compact Flash card to get you started.

HIGH-END DIGITAL CAMERA

Canon Powershot Pro1

REVIEW July 2004, p62 **RRP** £799

(£680 ex VAT) **PRODUCT INFORMATION**

Canon 08705 143 723 www.canon.co.uk



This well-designed 8megapixel prosumer digital camera is loaded with features, including a 7x optical zoom and remote control. It also takes stunning photos.

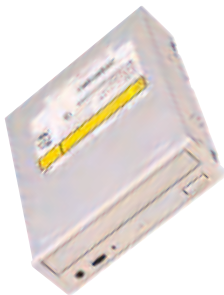
DVD-RW

NEC ND-2510A

REVIEW November 2004, p75 **RRP** £49.93

(£41.91 ex VAT) **PRODUCT INFORMATION**

NEC 020 8752 3665 www.nec.co.uk



The NEC ND-2510A doesn't come with any bundled software or free discs, but this 8.5GB dual-layer DVD is great value for money. At under £50, it's a real steal.

MEDIA CREATION SOFTWARE

Roxio Easy Media Creator 7.5

REVIEW July 2005, p72 **RRP** £69.99

(£59.57 ex VAT) **PRODUCT INFORMATION**

Roxio www.roxio.co.uk



With a wide range of audio, video, photo and DVD tools, this package represents excellent value for money and would suit those in need of a complete multimedia suite.

PC SECURITY SOFTWARE

Norton Internet Security 2005

REVIEW February 2005, p80 **RRP** £54.99

(£46.80 ex VAT) **PRODUCT INFORMATION**

Symantec 01628 592 222 www.symantec.co.uk



Providing protection from viruses, hackers and other privacy threats, as well as parental controls and anti-spam features, this is one of the best products to ensure your PC is both safe and secure.

OFFICE SOFTWARE

Microsoft Office Professional 2003

REVIEW May 2004, p150 **RRP** £459 (£390.64 ex VAT)

PRODUCT INFORMATION Microsoft 0870 501 0100

www.microsoft.com



This office suite offers a host of features, including a revamped version of Outlook. There are cheaper options available, but Microsoft's Office 2003 is the clear market leader.

PC MAINTENANCE SOFTWARE

Norton Systemworks 2004

REVIEW March 2004, p68 **RRP** £64.99

(£55.31 ex VAT) **PRODUCT INFORMATION**

Symantec 01628 592 222 www.symantec.co.uk



If you want to keep your PC healthy and safe, Norton Systemworks 2004 certainly gets the job done, and at the reasonable price of a penny short of £65 to boot

BACKUP SOFTWARE

Roxio Backup My PC Deluxe 6

REVIEW June 2005, p82 **RRP** £34.99

(£29.78 ex VAT) **PRODUCT INFORMATION**

Roxio 01908 278100 www.roxio.co.uk



Take the pain out of securing the data stored on your PC. Thanks to a clean and usable interface, and the help of various wizards, Backup My PC Deluxe 6 simplifies the whole process.

IMAGE-EDITING SOFTWARE

Adobe Photoshop Elements 3

REVIEW January 2005, p83 **RRP** £69.33

(£59 ex VAT) **PRODUCT INFORMATION**

Adobe 020 8606 4001 www.adobe.co.uk



If you can't afford the full version of Photoshop, Elements 3 is a good alternative. Building on the huge success of Elements 2, it's loaded with features and is great value for money.

VIDEO-EDITING SOFTWARE

Adobe Premiere Elements

REVIEW January 2005, p148 **RRP** £69.33

(£59.00 ex VAT) **PRODUCT INFORMATION**

Adobe 020 8606 4001 www.adobe.co.uk



Based on Adobe Premiere, the industry standard video-editing package, Premiere Elements is perfect for home users who want to edit their videos quickly and effectively without spending a fortune.

MUSIC CREATION SOFTWARE

Steinberg Cubasis VST 5

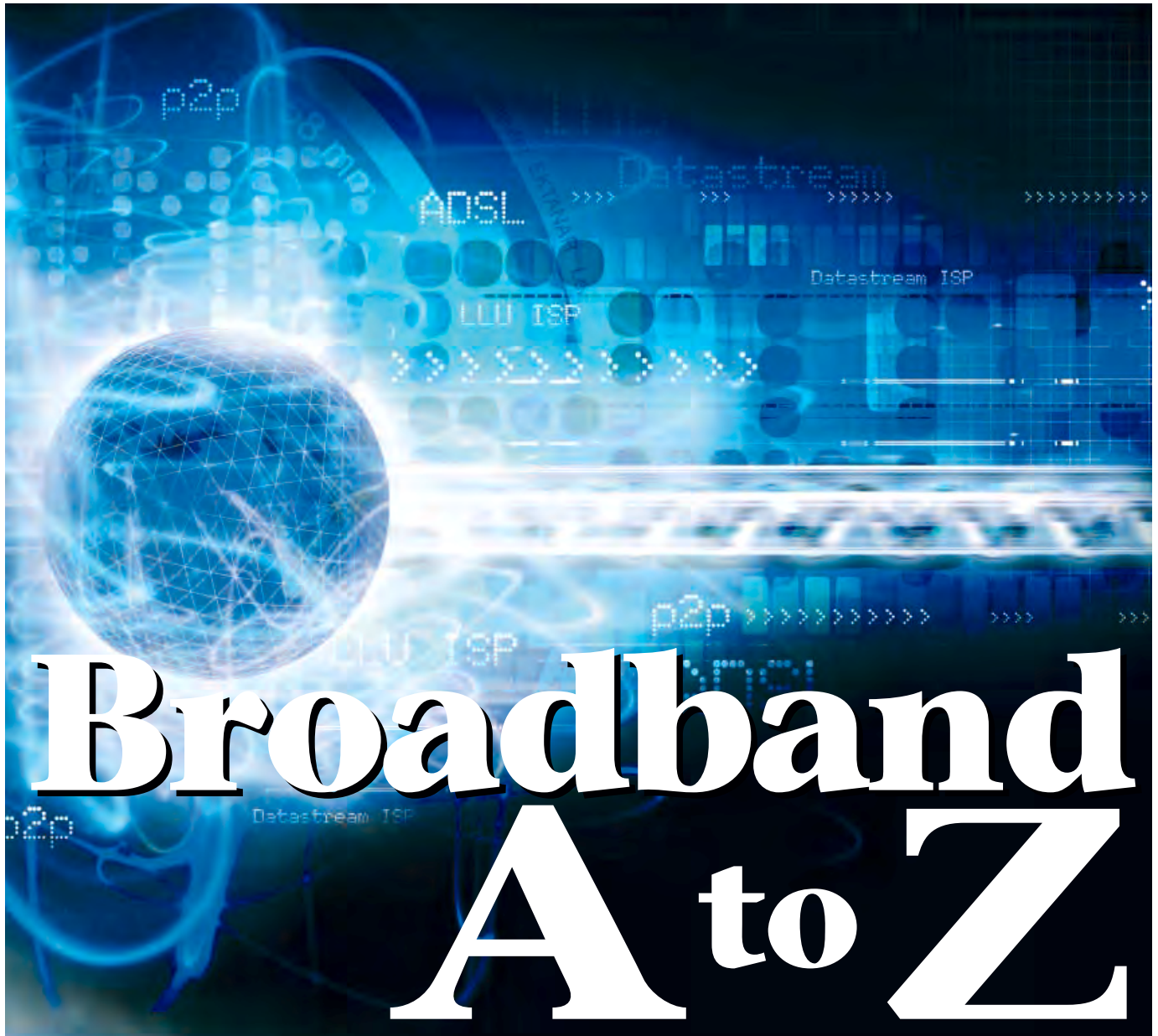
REVIEW March 2004, p67 **PRICE** £59.95

(£51.02 ex VAT) **PRODUCT INFORMATION**

Pinnacle Systems www.pinnaclesys.com



This sound-editing tool takes a bit of getting used to, but with a huge range of plug-in effects and a decent collection of virtual instruments, you'd be hard pushed to find a better package at this price.



WORDS: WILL STAPLEY ILLUSTRATION: VINCENT FRASER

All you need to know about usage levels and caps, finding the best package, tweaking the speed of your connection, plus we test 15 of the major services

Internet access has come a long way during the past five years, so we decided it was time to bring you *PCW*'s definitive guide to the current state of broadband in the UK and where it's headed. High-speed Internet access was released to the masses in 2000. Installation, setup and monthly fees all dropped to an acceptable level and homes across the UK started to take advantage of all broadband had to offer. Benefits included download speeds that had accelerated by up to 10 times, an always-on connection and a phone line that could accept voice calls while you surfed the Internet.

Recently, one of the most contentious issues has been the introduction of usage limits or caps. More and more Internet service providers (ISPs) have started to cap their packages and the term 'unlimited access' appears to have

an uncertain future. To find out more about these caps, we've spoken to ISPs, Internet traffic management companies and, most important of all, you the customers.

Having decided that you want high-speed Internet access, the next step is to choose an ISP. Whether you're on your third or fourth ISP, or perhaps still on a standard 56Kbits/sec dial-up service, our guide to finding your perfect ISP will be invaluable. We cover all the various types of packages, including pay as you go, capped and unlimited services, to help you decide which best suits your needs. To get hands-on experience of the packages, we set up trials with the major ISPs. You'll find our initial reviews throughout this feature and we'll publish follow-up reviews both online at www.pcw.co.uk and in the printed magazine over the next 12 months.



State of the nation

When broadband was first introduced to the home market it didn't take long for dial-up users to dump their old 56Kbits/sec connections if they could. Monthly subscription costs were initially high but, as demand increased, prices soon reduced and, by 2002, you could pick up a 512Kbits/sec service for around £30 per month. Despite falling prices, the biggest problem facing many users was coverage. BT quickly upgraded the majority of its exchanges, but even today, plenty of dial-up users are grumbling that their exchange isn't ADSL-enabled. Currently, BT statistics show UK broadband coverage at 96 per cent. The total number of broadband-enabled exchanges sits at 4,441, with 605 in the process of being enabled. A further 1,128 exchanges are to be enabled by the summer, bringing the coverage to 99.6 per cent.

Broadband uptake is strong and BT Wholesale, which provides the majority of ISPs with their connections, reported its five-millionth connection in April – not bad considering this target was originally set for 2006.

A broad definition

There's no precise definition for broadband, which does cause confusion. If you see a broadband package that's priced far lower than you expect, there will probably be a catch. The most common reason is a reduced connection speed, perhaps as low as 256Kbits/sec, however restrictions on usage are now coming into play.

Over the past few months, many ISPs have removed the unlimited tags from their advertising. Instead of offering an all-you-can-use-style service, they impose limits on their packages, ranging from 1GB a month right up to a 500GB cap. Whether this includes both uploading and downloading depends on the ISP and, as you'll see in our 'Common broadband usage' table on the next page, you might use far more bandwidth than you originally envisaged. What happens when you go over your usage cap is something of a grey area. You may be charged extra immediately, have your service downgraded or simply be warned that you're using too much bandwidth. If you've really been hammering away at your connection, you might find you're kicked

Find out if you can get broadband, with BT's availability checker



Depending on which package you go for, you'll be sent a router, such as the one pictured, or a USB modem

Nildram Broadband2go

'A welcome pack contained everything from login details to technical information relating to the online control panel and email configurations. There's a 1GB cap, and warning emails can be set up to tell you if you approach this limit. I exceeded the cap within two weeks due to heavy initial downloading, but the cost of downloading an extra 2GB is only £1.98.

I migrated from BT Business 500 and, after obtaining a MAC (migration authorisation code) from BT, was given an activation date from Nildram. On the morning of activation I entered my login details. Everything worked fine and there was no noticeable downtime.'

Gordon Laing



Freedom2Surf Connect Home

'The ordering process went smoothly, however when I received my starter pack I found the Fujitsu FDX340 USB modem wouldn't work with the version of OSX on my Mac. I spoke to the technical support people and they were aware of the problem, although they hadn't warned me about it. A new modem was sent out but I had to send back the original at my own expense, which I could then claim back as a refund.

Despite the early problems, the service is now running well. Detailed account information is available online, including usage meters – which is useful since it's a capped service.'

Anna Lagerkvist



off the service altogether. Back in February, Tiscali decided to expel around 500 subscribers who had been using between 30GB and 150GB a month.

Justifiable caps?

So why are ISPs capping what was originally marketed as an unlimited service? Whenever you access content that isn't stored in your ISP's local cache, the provider incurs a cost. One of the biggest sources of network traffic these days is peer-to-peer (P2P) activity – it has even taken over from standard HTTP web page traffic. The question is: are ISPs justified in applying caps?

The industry is divided on this matter. We spoke to Andrew Parker from Cache Logic (www.cachelogic.com), which offers traffic management services for ISPs and believes they could find a way not to cap services. According to Cache Logic's research, the vast majority of P2P traffic involves files larger than 100MB. If these large files are cached, ISPs can drastically reduce their costs. Parker told us that in one case, which happened to be after the release of a major movie, Cache Logic found a staggering 30 per cent of P2P traffic at one ISP was related to a single 600MB file.

Sandvine (www.sandvine.co.uk) is another traffic management company that offers ISPs the ability to distinguish applications such as Voice over IP (VoIP), P2P and online gaming. Managing director Chris Colman believes ISPs will soon move to a tiered service where packages are priced according to use. Introduction services, for example, would be for email and web surfing, while the likes of P2P and VoIP would require a premium package.

We asked ISPs their views on usage limits on broadband accounts. You can read comments from ISPs and traffic management companies at <http://tinyurl.com/dzcd8>, but we've published a selection on the following page.

PCW reader comments

Some of your views about usage limits, posted in the Internet and broadband section of our Testbed blog (www.pcw.co.uk/labs).

'Why should heavy users be punished when they are just using their connection to the fullest as originally provided by their ISP?'

Sylvia

'ISPs should give customers the choice of a low usage at a cheap price or a high usage at a higher price. You pay for how much you use.'

Jackie

'If I was told by my ISP I was using too much, I would move to an ISP with no restrictions.'

David C

'This capping scheme being started by certain ISPs, is in my opinion yet another way of squeezing more money from us users. Certain ISPs don't deserve our loyalty and we should vote with our feet... and dump them.'

Graham C

'In the same way those who travel furthest in their car pay more for fuel, I think it only right that a usage-based payment scheme is introduced. What are users downloading to exceed 50GB a month? Bootleg DVDs and CDs? Dodgy software? I'm not subsidising their excessive use of a shared commodity.'

Ralph Bacon

What the ISPs say

'A choice of different products is great for consumers, but selling capped services as full-fat broadband is misleading and confusing. If you plan to make the most of broadband, keep clear of the caps.'

AOL

'At Bulldog Broadband, we don't believe in putting a limit on how much our users can download. The whole point is to give people a better experience on the Internet and with data caps it's impossible to enjoy the web to the full.'

Bulldog Broadband

'Usage-based broadband is being driven primarily by end users. Our customer research suggests existing dial-up users thinking of migrating to broadband are demanding prices comparable with their current connection. They tend to feel uncomfortable paying extra for an unlimited service they will not necessarily use.'

Eclipse

'While other ISPs have taken a heavy-handed approach, we've addressed the issue with practicality and sensitivity. We estimate that less than one per cent of our customers [who download extremely large amounts of data] will be affected by our fair usage policy.'

Nildram

'We offer a range of services that include the genuinely unlimited Solo services for those who don't want to worry about caps or allowances. Our Lite service is for customers who mostly surf and email.'

Pipex

'The majority of broadband customers are generally interested in speed, rather than pushing the limits of how much they can download. The average user downloads around 6GB per month and our fair usage levels start from 30GB up to 125GB per month. We don't count overnight use, so even moderately high usage won't be affected by the policy. It makes good sense that customers who use more, pay more.'

Plus Net

PCW's view

ISPs must explain exactly what effect their caps will have, precisely how much it will cost users if they exceed the limit, and supply a suitable transfer monitoring service. We've seen 1GB limits described as generous and ISPs impose caps on previously unlimited services without offering an alternative. If this continues, broadband users will always view caps with suspicion.

It's sensible to have a variety of broadband packages to suit different users, but the industry needs to be far more open and honest with customers about capping.

Common broadband usage levels

If you've already got a broadband account and are thinking of moving to a capped service, work out your monthly usage by installing a download monitor such as Netmeter (<http://readerror.gmxhome.de>). This logs all data transfers, both upload and download traffic and can present daily, weekly and monthly reports on your usage. If you're trying to monitor traffic over a home network, install Netmeter on each PC and add the individual totals together to get the total usage.

On the other hand, if you're moving from a simple dial-up account to your first broadband package, it's very hard to gauge how much data you'll transfer each month.

Most ISPs count both download and upload traffic when calculating usage, but some only monitor downloads and some only monitor traffic during peak hours. What happens when you go over your limit also varies. The most common penalty is a flat-rate charge for the extra gigabytes, with the usual rate being around £1.50/GB. Check this with your ISP before signing up to anything.

To get a rough estimate of how much you might use, take a look at our typical download reference table below. Although downloading music and video are obvious bandwidth eaters, the likes of video and audio streaming, VoIP phone calls and even content rich websites will soon take up a fair proportion of your monthly allowance.

ACTIVITY	TIME/ AMOUNT	DATA TRANSFER (UPLOAD & DOWNLOAD)	NOTES
Downloading a feature film	1 film	700MB	Standard DivX-style video with no extras
General browsing	1,000 web pages	350MB	Average of 350KB per page (some content-rich pages can reach 900KB)
Downloading digital audio tracks	50 tracks	175MB	Average 3.5MB mp3 file
Video streaming (250KB stream)	1 hour	112.5MB	Quality of video directly affects download size
Downloading software	15 applications	100MB	Various applications, games, utilities
Listening to Internet radio (20KB/100KB stream)	1 hour	9MB/45MB	Depends on quality of audio streaming source
Making a VoIP call	1 hour	39MB	Standard VoIP phone call
Downloading security updates	1 month	25MB	Updates for Windows, anti-virus, firewall and spyware
Emailing photos	10 photos	25MB	Photo size of 2.5MB (can be reduced using Windows' resize feature)
Playing online games	1 hour	20MB	Varies with different games, doesn't include initial download of game
Downloading other software updates	1 month	20MB	General software updates (email client, Real Player etc)

Finding your perfect ISP

ISP checklist

Don't get stung when you sign up with an ISP. The following checklist will help you find out exactly what you're getting:

● Usage limitations

Read up about the usage limits you'll have to stick to. Some ISPs will have a fair usage policy that applies to services even if they're marked as unlimited. Check whether both download and upload data transfer are included in any cap and ask the ISP what happens if you go over your limit.

● Cancellation fees

Will your ISP charge you a fee if you decide to cancel within the first 12 months of your contract? Is the provider signed up to Ofcom's Code of Practice for migration?

● Minimum contract

How long is the minimum contract and notice period? Will you be tied to this ISP for a whole year?

● Installation and setup fees

Check out all applicable setup fees. If these are waived, check whether you'll have to pay them if you leave before a set date.

● Types of services available

ISPs offer different flavours of broadband technology: IPStream, Datastream and LLU (see box below right) and switching between these isn't always straightforward, although BT's Broadband Modify trial is addressing this issue. The majority of ISPs use BT Wholesale's IPStream service and it's relatively easy to switch between IPStream ISPs.

● Technical support costs and hours

A support desk that only operates during office hours can be frustrating. Check the costs of calling the support number.

● IP address

Most ISPs supply a dynamic IP address as standard, but some use static IPs. If you're going to be using network webcams or other such devices, enquire about a static IP upgrade.

● Is hardware included?

The majority of new installs come with free hardware, which will normally be a USB modem and two microfilters. Microfilters split voice and data streams on your telephone line. Every device attached to a phone line (handset, fax, satellite box) should be connected via a microfilter. If you're going to use your own equipment, ask for a wires-only service.

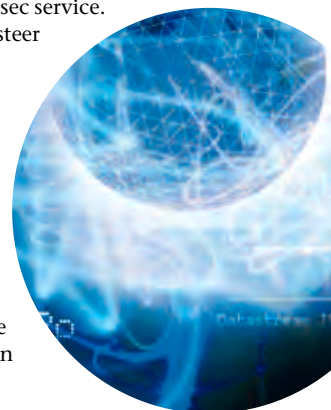
Broadband Genie's website lets you search for ISPs, find the latest deals and run speed tests (www.broadbandgenie.com)



Choosing a broadband package isn't easy, not least because you have to look out for usage caps and hidden clauses in the contract. The first thing you need to do is work out what you'll be using it for. If you're a light user, your best option will be to go for a lower monthly fee and opt for a capped service; the majority of home users will be perfectly happy using a 512Kbits/sec service. More demanding users will want to steer clear of caps and go for the fastest connection you can afford. Have a look at the Common broadband usage levels table on page 93 to get an idea of how much common Internet activities will eat into your usage allowance, which will in turn help you decide which package is best for you. If you want to compare all the latest packages from the major ISPs, go to the ADSL Guide (www.adslguide.org.uk), which has an extensive listing and search facility.

Pay as you go

Over the past few months, a selection of pay as you go (PAYG) broadband packages have started to appear. Just as with mobile phones, these tariffs don't include a monthly fee, but instead charge for how much you use the service. Metronet, Lixxus and Bulldog are among the ISPs offering



UK Online Broadband 8000

'My UK Online service came with an Actiontec wireless ADSL router. It was no



problem to install and I had the wireless network up and running very quickly. I moved from BT Broadband to UK Online. BT provided me with a MAC and, after giving this to UK Online, the transfer went smoothly. BT billed me in error, but this was soon sorted out. I was told the 8Mbps/sec service was a maximum connection rate and speed tests revealed I was averaging around 5,700Kbits/sec download and 465Kbits/sec upload. I haven't had any downtime yet.'

Alex Arias

Types of services explained

IPStream

This is the most common form of ADSL service. It uses BT equipment and BT Wholesale sells it on as a complete product to ISPs that, in turn, offer the service to end users at whatever rate they see fit.

Datastream

ISPs using a Datastream service run their own IP networks over BT's core infrastructure. The ISP can set its own contention ratio (eg 50:1, where 50 users share the same bandwidth) and speeds, something that's not possible with IPStream services. Datastream ISPs include Tiscali and Virgin.

LLU (Local Loop Unbundling)

This is when the ISP puts its own equipment in the BT exchange, enabling it to provide services at a far higher speed and a variety of contention ratios. LLU ISPs include Bulldog and UK Online, but coverage is very limited.

Which broadband package suits you?

To help you choose a package, here are some suggestions based on how you may use the Internet.

User 1

Rarely does anything more than check emails and occasionally browse the web.

Suggested package

It may well be best to stick with a simple dial-up account. A pay-as-you-go broadband account might be worth considering, but they usually involve a hefty installation fee and stipulate minimum usage conditions.

Expect to pay

Up to £10 per month.

User 2

Regularly sends and receives emails and browses the Internet, but doesn't usually download large amounts of music, video or play online games.

Suggested package

With such limited downloading, a capped service is recommended. A cap in the region of 3GB should suffice. There's little point opting for anything more than a 512Kbits/sec service.

Expect to pay

£13-£17 per month.

User 3

Often downloads small utilities, occasional music files and streaming media. This type of user is unlikely to download large amounts of data.

Suggested package

Again, if you can pick up a cheap 512Kbits/sec service there's no point paying for speed you won't use. With the streaming media and average download levels, anything less than a 5GB cap could become restrictive.

Expect to pay

£17-£20 per month.

User 4

Regularly downloads music and video, streaming media and plays online games. Occasionally downloads files exceeding 50MB.

Suggested package

A 1Mbit/sec or 2Mbits/sec service. Alternatively, a 512Kbits/sec service that lets you occasionally boost your connection speeds might be cheaper. Any cap under 15GB would be a disadvantage.

Expect to pay

£20-£25 per month.

User 5

Regularly downloads large amounts of music and video or shares a single connection between two or more PCs.

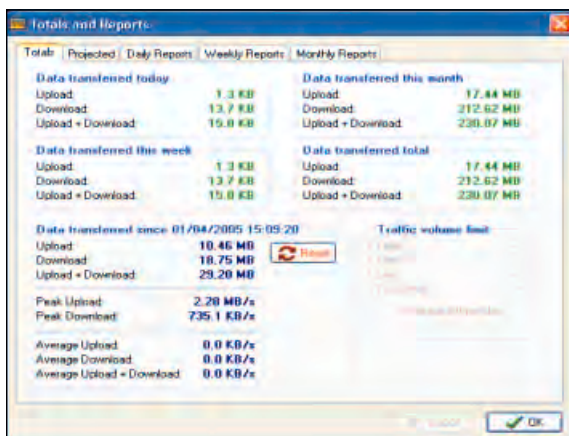
Suggested package

A 2Mbits/sec service with no restrictions on usage. It might be possible to stick to a cap of around 30GB, but an uncapped service is definitely preferable. If you're in an LLU ISP region (Bulldog, UK Online), you might be able to get a service faster than 2Mbits/sec.

Expect to pay

£25-£40 per month.

PAYG broadband packages, but before you rush into signing up for one, it's important to check out each individual offering. For example, Lixxus requires that you don't exceed 60 days of low or no-usage periods every year. This is discretionary and is mainly there to stop people installing it in a holiday home where it would be used for only a couple of weeks a year. This is understandable, since Lixxus has to pay BT Wholesale for your connection whether you use it or not. We spoke to Lixxus customer services, who said it wouldn't be a problem for someone to use their PAYG service just at weekends, for instance. The price per megabyte downloaded depends on how much you use (a calculator can be found at www.lixxus.co.uk), and each PAYG service is capped at a certain limit so you'll never pay more than a set amount each month.



Netmeter will help you find out how much data you are downloading or uploading, so if you have a capped service you can ensure you stay within the limits

PAYG broadband is a good stepping stone for those moving from dial-up who are unsure whether they'll benefit from broadband and don't want to commit to a year's contract. That said, if you start using it a lot you'll find yourself paying over the odds and would be better off switching to a standard pay monthly package.

Migrating to another ISP

The Office of Communications (Ofcom), which regulates the telecommunications industry, drew up a Code of Practice for broadband migration last year. It's a voluntary code, so there's no obligation for ISPs to sign up, but those ISPs that do, agree to make the migration process

Eclipse Flex 500

'I was on a dial-up connection so didn't have to migrate from another service. The online ordering process was easy to follow, but shortly after placing my order I was told my local exchange was full. This meant it had no free ports for new broadband connections, a problem which can be solved quickly by adding ports. After emailing Eclipse to enquire how long I would have to wait, I was told it was BT's problem and out of Eclipse's control. However, two weeks later BT gave the go-ahead and the service was up and running. This Flex package allows me to instantly boost the connection from 512Kbits/sec to 2Mbits/sec – a useful feature that works well.'

Tim Smith



I can't get broadband

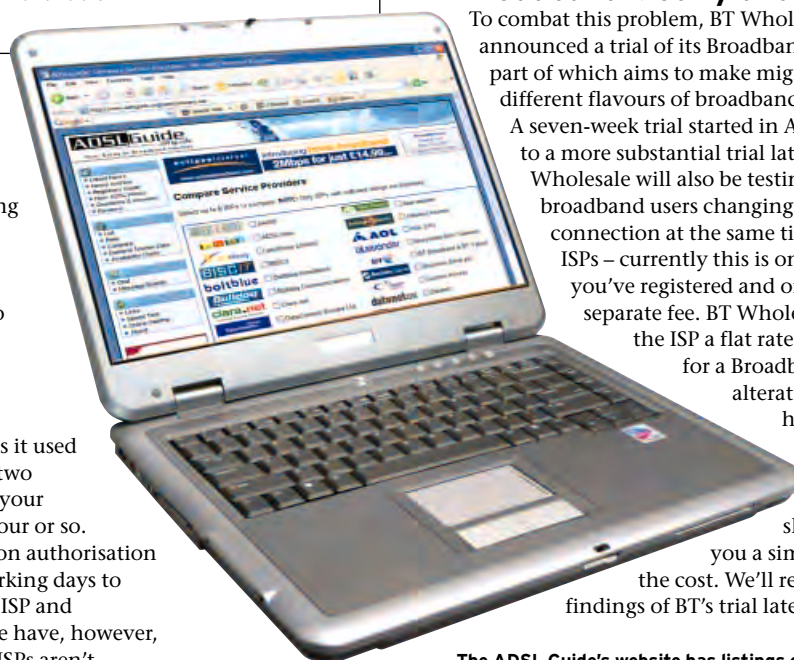
If you've put your details into BT's availability check service (www.bt.com/broadband) and it tells you your line is unsuitable for broadband, don't give up immediately. Try going ahead with the ordering process with your chosen ISP because, although BT's online checker is a good indication of your line's suitability, you won't know for sure until you put in an order. Your ISP shouldn't charge you if your line is found to be unsuitable and may well apply pressure to BT if it believes your line is unfairly being marked as unsuitable.

One reason for you being unable to get broadband may be that, as part of the activation, an engineer will need to visit your property to test the line. We've heard about many cases where a household is told its line is unsuitable and yet neighbours are enjoying a broadband connection. There are many variables that can affect your chances, including poor-quality lines connecting to your home. If you can't get a 512Kbits/sec service, it's worth trying an ISP that offers a slower broadband connection, such as Zen's Home 250 service (www.zenbroadband.com). It won't set the world alight with its speed, but is certainly better than dial-up.

If you still have no luck but have plenty of money to burn, consider satellite broadband. Bentley Telecom (www.bentleytelecom.co.uk) offers home satellite broadband packages, as does Tariam (www.tariam.co.uk), but both installation and monthly fees are much higher than standard broadband. Another option if you have a BT line is AVC's hybrid satellite/phone service (www.avcbroadband.com), which is much cheaper than full satellite services but is still available throughout the UK.

as simple as possible for their customers. So far, over 30 ISPs have signed up including AOL, BT, Bulldog, Virgin and Zen Internet. For more information head to www.ofcom.org.uk/advice/telecoms_ifc and click on the Codes of Practice link.

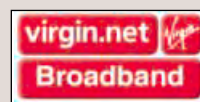
Switching between ISPs isn't as hard as it used to be. If you're simply moving between two IPStream ISPs you shouldn't be without your Internet connection for more than an hour or so. Ask your current ISP for a MAC (migration authorisation code), which usually takes up to five working days to receive, then give this code to your new ISP and everything should transfer smoothly. We have, however, heard a few horror stories when certain ISPs aren't particularly willing to provide a MAC – email us at letters@pcw.co.uk if this sounds familiar.



Virgin Plan One

'I was previously on a BT dial-up account so didn't have to migrate. I had no problems ordering the service online. Documentation is well thought-out and split into three sections that take you step by step through before, during and after installation. I've only had to contact customer services once, about a password problem. They were extremely helpful and explained what I was doing wrong, and stayed on the line to ensure everything was working properly. Connection speeds are consistently good at around 490Kbits/sec and I haven't had any downtime.'

Maddy Kent



When it comes to switching between two Datastream providers or from a Datastream ISP to an IPStream service and vice versa, things get a little more complicated. Users are often left without a broadband connection for up to two weeks during the switch, which isn't an option for those who rely on their high-speed connection.

Broadband Modify trial

To combat this problem, BT Wholesale recently announced a trial of its Broadband Modify service, part of which aims to make migration between different flavours of broadband service quicker. A seven-week trial started in April and will lead to a more substantial trial later in the year. BT Wholesale will also be testing the feasibility of broadband users changing the speed of their connection at the same time as switching ISPs – currently this is only possible once you've registered and often incurs a separate fee. BT Wholesale will charge the ISP a flat rate of £11 ex VAT for a Broadband Modify alteration, regardless of how many changes are made as part of a single order. Your ISP should then charge you a similar fee to cover the cost. We'll report back on the findings of BT's trial later in the year.

The ADSL Guide's website has listings of broadband providers so is the place to go if you want to compare services before buying

Lixxus Lixxstart 2000

'I moved from a dial-up account to Lixxus' Lixxstart 2000 pay-as-you-go service. Regular emails detailed the progress of the order, date of activation and so on. From order to activation took 10 working days and I was given a unique email address to contact should I have problems. A step-by-step guide had clear instructions on how to install the hardware and software, although a couple of steps were missed or in a slightly different order. The service is up and running perfectly and I've had no need to contact customer services.'

Debbie Oliver



Bulldog and Tiscali services

We invited Bulldog Broadband and Tiscali to take part in this broadband test at the same time as we asked the other companies featured here, however, due to delays beyond our control, neither the Bulldog Interactive or Tiscali Broadband x20 services had been activated by the time we went to press with this issue of PCW.

Unfortunately, this meant we were unable to test these two services in time for the feature. However, activation is currently in progress and, as with the all other packages reviewed here, we will be reporting our experiences both in the magazine and online at www.pcw.co.uk over the next 12 months.



Using your service

So, if you've sorted out your ISP and your line's been activated, you need to make sure your connection is running at full capacity. To check your service is running at the correct speed, try a couple of tests. Both ADSL Guide (www.adslguide.org.uk) and DSL Reports (www.dslreports.com) offer a speed test service. It's quite normal for your speed to be a little lower than advertised (for example, 1.9Mbps/sec for a 2Mbps/sec service), but if it's substantially lower it could indicate a problem.

The first thing to do is contact your ISP and explain your concerns. If you don't get anywhere you can try tweaking your connection. Download a copy of Dr TCP from www.dslreports.com/drtcp. This tool lets you adjust Registry settings and, in certain cases, can drastically increase your connection speed. You'll find a full FAQ about Dr TCP on the DSL Reports site.

Sharing your connection

If you've got more than one PC, it makes perfect sense to let others use your Internet connection. The cheapest way of doing this is to attach a broadband modem to one and then simply network it to your other PCs via a Ethernet cables and a hub (or with just a special crossover Ethernet cable if you've only got two PCs).

Pipex Solo 1000

'I migrated to the Pipex Solo 1000 service from Wanadoo, which gave me a MAC number without any problem. I hadn't heard from Pipex by the time my Wanadoo connection was cancelled, however a call to Pipex (which included 15 minutes on hold) revealed it hadn't supplied me with my username and password. This was sent via post and arrived two days later.

The service is very fast. Although it's listed as a 1Mbit/sec service, I've experienced download speeds of up to 170Kbits/sec, which is way above what's expected of a 1Mbit/sec connection. To date there's been no downtime.'

Anthony Dhanendran



Sharing your connection is easy with an all-in-one ADSL modem, router and switch

Tesco Broadband

'I was on a Tesco dial-up account, so upgrading to its broadband service didn't require a migration process. The online ordering system was logical and easy to understand. I went for the Internet Security option (50p per month), which gives me a spam protection and an online content filter, along with firewall and anti-virus software. The security installation CD arrived after my activation date, which meant I had to wait for a couple of days to avoid going online unprotected. Since the installation, service levels have been good and there has been no noticeable downtime.'

Gill Stapley



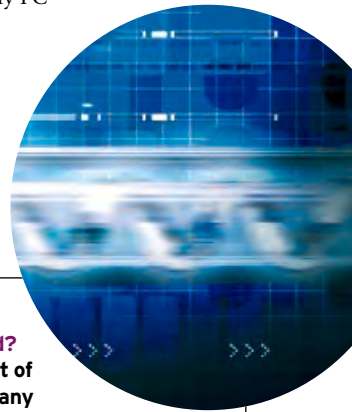
This option has the disadvantage, however, of relying on the main PC being turned on whenever an Internet connection is required on the other networked PCs.

A far better solution is to invest in an all-in-one

ADSL modem, router and switch – often sold as a DSL routers or a DSL gateway. This connects directly to your phone line and each networked PC connects to it directly via Ethernet cables.

Wireless models will also let you share the connection with wireless PCs or notebooks. This connection is always on, so is always available to any PC

that needs it. Modern routers are incredibly easy to set up and there's no need for extensive networking knowledge. If you're using a cable TV set-top box for your Internet access (NTL or Telewest), you should buy a model that doesn't include an ADSL modem.



Troubleshooting: your problems solved

Q. Why does my router keep dropping the Internet connection?

A. This problem is often solved by upgrading your router's firmware. Head to the manufacturer's website and look in the support section for firmware updates and known problems. If you have a USB modem, try using it to connect instead of the router. If it works, your router configuration is likely to be the problem. It's also worth checking whether your ISP has a disconnect policy. The length of the time-out will vary between ISPs, but if you're experiencing problems then give your ISP a call.

Q. I've got a crackling noise on my phone – will it slow my connection down?

A. More than likely. Try disconnecting the modem from the phone socket. If the noise disappears you've probably got a faulty microfilter. If the noise remains, contact your telephone operator and ask for a line check.

Q. I need to use a phone extension lead to reach my PC – will this affect my broadband?

A. Unless you're going to use a large amount of extension cabling, it's unlikely you'll notice any difference. We've set up broadband using 20m of extension cable with no problems.

Q. I'm receiving email but I can't seem to access web pages?

A. A common cause of this problem is a Domain Name Server (DNS) virus. This will alter your DNS settings so that web addresses relate to incorrect IP addresses. After updating your anti-virus utility, run a full scan.

In addition, download Adaware (www.javasoftusa.com) and do a scan for spyware. If you still have problems, search on the manufacturer's website for new firmware for your broadband hardware.

The need for speed

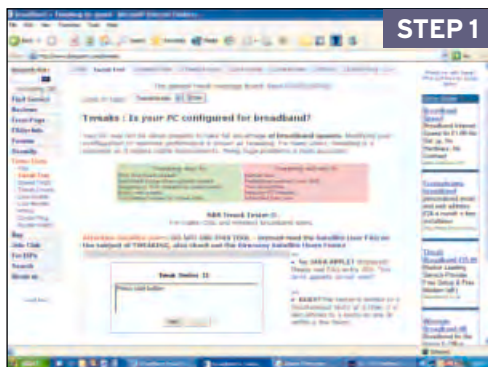
If you want to maximise your broadband speed, you can use a tool called Dr TCP, which you can download from the Tests + Tools section at www.dslreports.com. The steps below will show you how to adjust the Maximum Transmission Unit (MTU) and TCP Receive Window (RWIN) settings.

The MTU determines how much data can be transmitted in one go before having to be split into smaller pieces. While a bigger MTU is

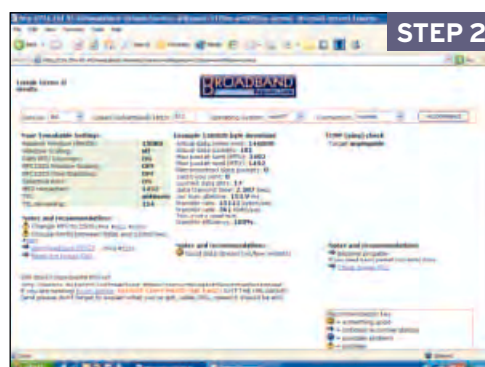
better, if it is set too high, data loss will occur; too low and more time will be spent acknowledging receipts.

The RWIN setting controls the amount of data that can be received before an acknowledgment is issued to the sender. If the sender doesn't receive an acknowledgement, RWIN will try to resend the data. If the RWIN is too high, packets may start corrupting.

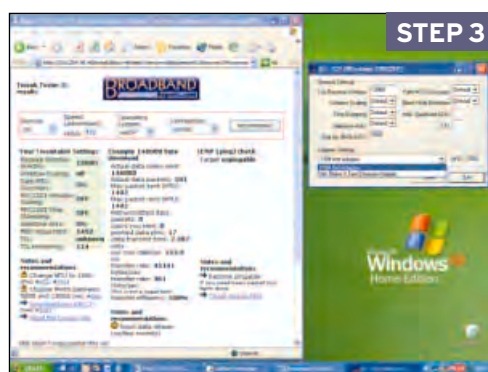
Run regular speed tests to judge any changes in performance.



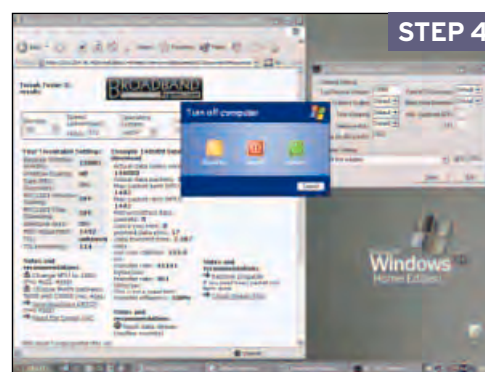
RUN THE TEST
To get an idea of what RWIN and MTU settings you should be using, go to Tests + Tools at www.dslreports.com. Select the Tweak Test option and when the test has finished, hit Results and enter the details of your broadband connection.



RECOMMENDED SETTINGS
Here you'll see your settings. Dr TCP can alter any highlighted in green. Note both the suggested MTU setting and the predicted optimum RWIN range, under Notes and recommendations



RWIN SETTING
Enter settings into Dr TCP. In the TCP Receive Window box, enter a value between the two recommended RWIN figures – it's probably best to select a number at the top end of the suggested range



MTU SETTING
Enter the suggested MTU figure in the Dial up MTU box, click on Save and restart. The two most common optimal settings are: RWIN: 12762 & MTU: 1458
RWIN: 13900 & MTU: 1430

What next for broadband?

The future for broadband in the UK is ADSL2+. Using the existing copper lines that supply your current broadband service, ADSL2+ promises to deliver greater performance. It has a theoretical top speed of 24Mbps/sec, but 18Mbps/sec is more realistic. However, ADSL2+ speeds rapidly deteriorate the further you are from the exchange. Studies suggest that if this distance is more than 3km, your best option is to stick with your standard ADSL connection. Broadband hardware also needs to be ADSL2+ compliant. Although most new devices are compatible, a lot of older hardware will need upgrading.

There is no date for the first public launch of an ADSL2+ service, but Easynet, which supplies UK Online with its 8Mbps/sec service, expects to be rolling out an ADSL2+ service in the second half of this year. Aside from ADSL2+, BT is testing an 8Mbps/sec broadband service.

With speeds increasing to levels far higher than we enjoy today, usage limits imposed by more and more ISPs will become an even more contentious issue. The last thing you want is to have a lightning-fast connection that you are to afraid to use because it will cost too much.

AOL Platinum

'I upgraded to AOL's Platinum broadband service from a dial-up



connection, but the installation didn't go as smoothly as I had hoped. The equipment arrived on time, but each time I surfed the Internet I'd get an Action cancelled error message after two or three pages. I called customer support, but despite them being courteous and polite, they could not solve the problem. After speaking with my colleagues on PCW, I found out my PC had been infected by a virus before the AOL software had been installed. After I removed this virus using AVG, the broadband service worked without problems – it's just a shame AOL support weren't able to identify what this problem was.'

Alan Rider

ISPs on trial

The following tables have the details of the ISP trials being run by the PCW team and, over the next 12 months you'll find updates both online and in the magazine. Some early entries can be read in the Internet & Broadband category on the Test Bed at www.pcw.co.uk/labs.

ISP	AOL	BT BUSINESS BROADBAND	BULLDOG	ECLIPSE	FREEDOM 2 SURF	HOMECHOICE	LIXXUS	NILDAM
PACKAGE	PLATINUM	BUSINESS SINGLE 2000	INTERACTIVE	FLEX HOME 500	CONNECT HOME	4MB ENTRY LEVEL	LIXXSTART 2000 PAYG	BROADBAND 260
URL	www.aol.co.uk	www.bt.com/broadband	www.bulldogbroadband.com	www.eclipse.net.uk	www.freedom2surf.net	www.homechoice.co.uk	www.lixxus.co.uk	www.nildram.net
Sales telephone	0800 376 5432	0800 389 8714	0800 056 6745	01392 333 333	0870 242 3758	0800 072 4454	0845 456 6303	0870 1608 602
Monthly fee inc VAT (ex VAT)	£29.99 (£25.52)	£29.99 (£25.52)	£19.50 ⁽¹⁾ (£16.60)	£23.95 (£20.38)	£24.99 ⁽⁴⁾ (£21.27)	£60 ⁽⁵⁾ (£51.06)	Pay as you go	£15.99 (£13.61)
Setup fee inc VAT (ex VAT)	Free	Free	£1 ⁽²⁾ (85p)	Free ⁽¹⁾	Free ⁽⁴⁾	£1 ⁽¹⁾ (85p)	£70 (£59.57)	Free
Max download/upload speeds (Kbits/sec)	2,048/256	2,048/256	4,096/400	512/256 ⁽³⁾	2,048/256	4,096/288	2,048/256	2,048/256
Monthly cap	None	None	None	None	10GB	60GB	None	1GB
IP address	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Static	Dynamic
Type of service	IPstream	IPstream	LLU	IPstream	IPstream	LLU	IPstream	IPstream
Contention ratio	50:1	50:1	40:1	50:1	50:1	20:1	50:1	50:1
Support hours /cost	8am-midnight every day/free	24/7/ 0845 number ⁽⁷⁾	9am-8pm Mon-Fri, 10am-4pm Sat/free	8am-8pm Mon-Fri, 9am-5pm Sat/ 01392 number	9:30am-5:30pm M/W/F, 9:30am-8:00pm Tu, Th/ 0870 number ⁽⁷⁾	8am-11pm every day/ 0845 number ⁽⁷⁾	9am-5:30pm Mon-Fri/ 0845 number ⁽⁷⁾	24/7/ 0870 number ⁽⁷⁾
Min contract (months)	12	12	1	1	12 ⁽⁴⁾	12	1	30 days
Router/modem included?	Modem ⁽¹⁾	Modem	7	7	7	Router	7	7
PCW's first impressions	Virus on PC prior to installation caused problems	Good customer services	Delayed connection	Flex feature works well	Incorrect modem supplied for Mac	A versatile package that works well	Installation went well	Migration smooth; no noticeable downtime

Enjoy the New Switching Experience

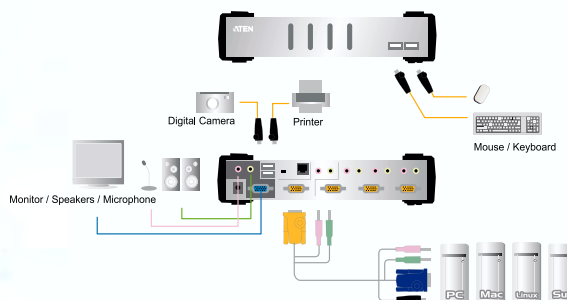
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ISP	PIPEX	TELEWEST	TESCO	TISCALI	UK ONLINE	VIRGIN	WANADOO
PACKAGE	SOLO 1000	BLUE YONDER 1MB	BROADBAND	BROADBAND X20	BROADBAND 8000	PLAN ONE	HEAVY USER
URL	www.pipex.net	www.telewest.co.uk	www.tesco.net	www.tiscali.co.uk	www.ukonline.net	www.virgin.net	www.wanadoo.co.uk
Sales telephone	0870 909 8000	0845 142 0220	0845 650 8000	0800 107 9000	0800 053 0606	0845 676 0762	0870 010 2462
Monthly fee inc VAT (ex VAT)	£23.44 (£19.95)	£25 (£21.28)	£19.97 (£16.99)	£15.99 (£13.61)	£29.99 (£25.52)	£24.99 (£21.27)	£27.99 (£23.82)
Setup fee inc VAT (ex VAT)	Free	Free ⁽¹⁾	Free	Free	£50 (£42.55)	Free	Free
Max download/upload speeds (Kbits/sec)	2,048/256	1,024/128	512/256	1,024/256	8,192/400	512/256	1,024/256
Monthly cap	N/A	N/A	None	2GB	500GB	None	30GB
IP address	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic
Type of service	IPstream	LLU	Datastream	Datastream	LLU	Datastream	IPstream
Contention ratio	50:1	Not specified	50:1	50:1	33:1	50:1	50:1
Support hours/cost	9am-8pm Mon-Fri, 9am-6pm Sat/ 0845 number ⁽⁷⁾	24/7/ 0845 number ⁽⁷⁾	8am-midnight every day/ 50p per minute	8am-midnight every day/ 0870 number ⁽⁷⁾	24/7/ 0845 number ⁽⁷⁾	24/7/ 25p per minute	24/7/ 0870 number ⁽⁷⁾
Min contract (months)	1 ⁽⁶⁾	12	12	12	12	1	12
Router/modem included?	Modem	Cable modem	Modem	Modem	Wireless router ⁽¹⁾	Modem	Wireless router ⁽¹⁾
PCW's first impressions	Long customer services hold times	Occasional breaks in service	Security CD arrived after connection	Delayed connection	Painless migration; average 5.7K connection	Simple installation; helpful customer services	Good service, but shaky customer services

NOTES: 1 = Time-limited offer; 2 = With Bulldog phone line; 3 = Can be increased to 2Mbps/sec; 4 = One-month contract available with installation fee and reduced monthly fee; 5 = Discounted to £34.99 for first three months. Includes TV packages; 6 = Cancellation fee of £58.75 applies if you leave during first 12 months; 7 = 0845 - 3p/min weekdays 6am-6pm, 1p/min all other times; 0870 - 7.51p/min weekdays 6am-6pm, 3.75p evenings, 1.5p/min weekends



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Zoom X6 ADSL Wireless Modem Gateway/Router/Firewall/Switch



The X6 is equipped with Prism™ Nitro Mode technology to minimize collision problem created with a mixed network and maximize network performance. Prism Nitro Mode also includes packet bursting technology to deliver up to a 140Mbps throughput for 802.11g only networks and up to a tripling of speed in a network with both 802.11b and 802.11g devices. Wireless security includes the newer Wi-Fi Protected Access (WPA) protocol as well as Wired Equivalency Protection (WEP).

Features:

- ADSL2/2+ compliant modem for faster ADSL speeds
- Prism Nitro technology offering up to 140Mbps
- 802.11 (g) and (b) Wireless Access Point
- Non-blocking mixed network wireless connection
- High-performance antennas for superior wireless range
- Advanced SPI & NAT Firewall with DOS and PortScan protection
- Built-in 10/100 four port Ethernet switch supports upto 253 computers
- Wi-Fi Protected Access (WPA) and Wired Equivalency Protection (WEP)
- Supports Universal Plug and Play (UPnP)
- Two year warranty

Zoom X5v VoIP ADSL Modem Gateway/Router/Firewall/Switch



Features:

- VoIP ATA with ZoomTeleport™
- Use your standard phone to make VoIP Calls inc; Analogue, DECT and Wireless.
- FREE VoIP to VoIP calls
- 10mins FREE VoIP to PSTN calls
- PSTN fail-safe for power cuts and emergency
- True SPI & NAT firewall with DOS protection
- 4 port 10/100Mbps Switch and USB Port

VoIP enables you to turn voice in to data and send it over your broadband line.

You can make three different types of calls:

- Dial your call normally and this will go out over the traditional PSTN telephone network. (Billed by your standard telephone company)
- When you want to make a VoIP call, dial a # then the persons VoIP number. This call is FREE with no limits on length or distance.
- Sign up for the Enhanced Global Village service or any other VoIP service provider, to let your call go over a special Internet gateway and out on to the PSTN telephone network. (Billed by Global Village or chosen SIP provider)

Please visit www.globalvillage.com for more information

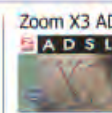
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No External Power Supply
Compact Design



Zoom X3 ADSL Ethernet Modem

Gateway Router
SPI Firewall



Zoom X4 ADSL Ethernet + USB Modem

Gateway Router
SPI Firewall



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SPI Firewall
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UK.INSIGHT.COM



WORDS: ARTUR HOFFMAN, SASCHA FABER & NICOLE OTT

Harness the power of 64

Find out whether this much vaunted technology will offer the promised speed, stability and security enhancements and whether it's worth making the move

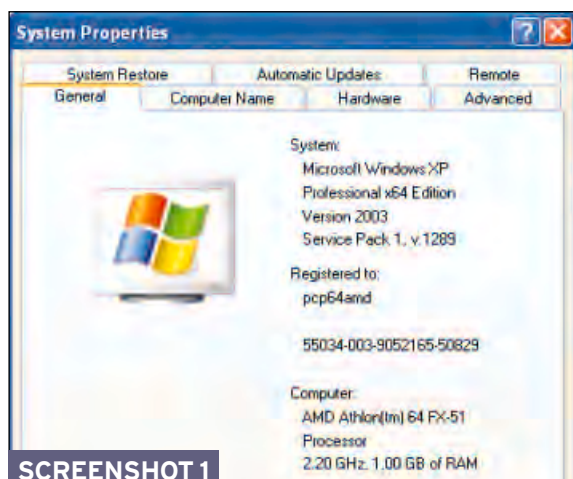
Is your virus scanner slowing down your computer's performance? Does converting a video to DivX format take forever or does your web server collapse if too many customers place orders at the same time? Well, don't worry, 64bit computing is supposed to be the technology that will solve all these problems in the near future.

Windows XP will be able to address 32GB of memory using 64bit technology, compared to 'merely' 4GB with 32bit technology. Resource-intensive applications such as the 3D modelling software Maya or 2D image manipulation packages such as Photoshop can really

benefit from this extra memory, as can large database applications.

Since 2003, AMD's Athlon 64 and Opteron processors have supported 64bit processing. Intel has now caught up and all future Pentium CPUs will have 64bit extensions (which Intel calls EM64T – Extended Memory 64 Technology) as standard. In principle this will mean the majority of new PCs are 64bit-capable. These new CPUs work like normal 32bit processors when running 32bit versions of Windows. But this is about to change, with the recently-announced availability of Windows XP Professional x64 Edition and Windows Server 2003 x64 Edition.





SCREENSHOT 1

The interface has not changed, so you'll have to go to System Properties to find out that this is the 64bit version of Windows XP

The 64bit CPU speeds up the processing of large amounts of data. It can be moved more quickly because it is moved around in larger chunks at the same clock speed. And that's not all: according to Microsoft, when used with suitable hardware, the operating system will in future be capable of using even more Ram. If memory prices keep falling, by the end of 2007 the average amount of Ram in a PC could be over 4GB.

Quicker with 64bit

Achieving performance increases using 64bit technology relies on suitable 64bit programs being available. At the moment there aren't many programs around, but there are a few. System analysis utility Sisoftware Sandra Professional 2005 SP2 already supports 64bit Windows and is useful for judging any performance increases. Under 32bit Windows, our AMD test computer achieved 22,474 iterations per second with the Sandra's CPU multimedia benchmark. This increased by 12.5 per cent to 25,260 iterations/sec using 64bit Windows. A doubling of performance is not on the cards, but the new architecture shows clear potential for some performance gains.

We found the increase in performance was greater with Intel CPUs, where additional features of the new Windows version come into play. For example, the operating system is based on the Windows 2003 kernel which makes better use of the Intel CPU's Hyperthreading technology. The processor's performance in Sandra's floating point test also increased by a satisfying 57 per cent from 36,326 to

57,064 iterations/sec. However, the results from the benchmark test must be treated with caution. Performance with real 32- and 64bit applications is what really counts – and this could produce an entirely different picture.

When copying large files the performance advantage of 64bit becomes apparent. We copied a 1GB compressed video file from one hard disk partition to another. On the 32bit AMD computer this took 141 seconds, but on the 64bit AMD

machine it fell by 46 per cent to 76 seconds. On the Intel PCs, there was a similar 45 per cent reduction in time.

No worries for 32bit software

If you want to change to the new operating system, you don't have to wait for 64bit software as, in principle, 32bit software works fine under Windows XP Pro x64. This is made possible by the new Windows on Windows 64 (Wow64) Emulation Layer. This keeps 32bit and 64bit applications apart, preventing conflict between files and Registry keys. Interoperability between programs remains unaffected, so that, for example, you can still transfer data from application to application using cut and paste. However it's not possible for a 32bit application to access a 64bit DLL (dynamic link library) driver file.

The strict separation between 32bit and 64bit applications is also evident from the default installation paths. While the operating system specifies C:\Program Files (x86) for 32bit applications, native 64bit applications are installed to C:\Program Files\ . The performance of 32bit programs does not change appreciably under the 64bit operating system. In our tests we found that the performance was almost identical to that on a fully 32bit platform. The differences in benchmark results between 32bit software on 32bit Windows and 32bit software on 64bit Windows fell within our measurement tolerances.

No future for 16bit software

Older 16bit applications are shunted completely to one side, however, and will no longer run on 64bit Windows. On the RC1 installation CD Microsoft included a list of

Under the microscope

We tested the Release Candidate 1 (RC1, Build 1289) of the 64bit version of Windows XP Pro. As our test platform we used one AMD and one Intel system. For the AMD system, we used an Athlon 64 FX51 CPU and for the other an Intel Pentium 4 3.4GHz with EM64T 64bit extensions.

If you're expecting the 64bit version of Windows to look different to previous releases, you'll be disappointed: Windows XP Pro x64 Edition looks exactly the same, has the same functions and is used in the same way as the 32bit version (see screenshot 1). Nothing has changed in the familiar interface. The important changes stay out of sight, hidden in the engine room of the operating system. Our tested version was based on the Windows XP (SP1) codebase, but nonetheless included all the features introduced in SP2, such as the Security Center, improved Bluetooth and Wlan support and the pop-up blocker.

If you look back at the major leap from the 16bit Windows 3.11 to the 32bit Windows 95, the change to the 64bit platform doesn't seem very drastic. When Windows 95 was launched, even home users were finding the 4MB Ram limit in Windows 3.11 frustrating. Today, however, even professional users of Windows XP don't really have memory shortage problems.

However, the advent of 64bit is by no means premature: when working on large projects in demanding areas such as video, 3D rendering or Cad, the limits of 32bit systems are already noticeable. In conjunction with the latest processors, Windows XP Pro x64 Edition supports up to 32GB of system Ram (see table 1). In addition, the amount of Ram which a single program can address is no longer limited to 2GB.



TABLE 1: The evolution of Windows

				
	MS DOS 1	WINDOWS 3.11	WINDOWS 95	WINDOWS XP
Date	1980	1993	1995	2005
Bus width	16bit	16bit	32bit	64bit
Maximum Ram	1MB	16MB	4GB	32GB
Processor	Intel 8088 to 386DX	Intel 8088 to 386DX	Intel 386DX to Pentium 4 and AMD K5 to Athlon XP EM641 Athlon 64	Intel 386DX to Pentium 4 and AMD K5 to Athlon XP EM641 Athlon 64

64bit software bottleneck

Crucial to the success of 64bit technology is the availability not only of the operating system but also application software. The majority of current 32bit software will work fine without modification under Windows XP Pro x64, but a 64bit operating system and hardware will come into their own only when 64bit versions of standard software applications arrive.

programs which definitely won't work under Windows XP Pro x64. The list includes around 300 applications and drivers, including well-known programs such as Black Ice Defender 2.1, F-Secure Anti-Virus and Zip Magic. A number of Microsoft products, such as the Windows 2000 Administration Tools, Microsoft Exchange Server 5.5 Standard and Enterprise Edition, as well as Microsoft Proxy Server 2.0, are also incompatible and will have to be uninstalled before updating the operating system.

No more virus scanners

A major change is that 32bit software which sets up its own services is blocked in 64bit Windows. This applies to a lot of desktop security applications such as firewalls, virus scanners and disk-imaging utilities (see screenshot 2). In almost all cases, 64bit Windows will not let the setup routine finish. You'll have to upgrade to whichever 64bit security product is available.

In addition, software which requires the Microsoft .Net Framework 1.1 to be installed is incompatible, but help is nearly at hand as a beta 64bit version of .Net is available.

Included in the new release of Windows XP is a 64bit version of Internet Explorer. The latest incarnation of the web browser fixes many problems with ActiveX controls. For example, the 64bit version of Internet Explorer included in Build 1281 could not access the Windows Update site but this has been fixed in the later builds. Nonetheless, for compatibility reasons Microsoft included the 32bit version of the browser in RC1.

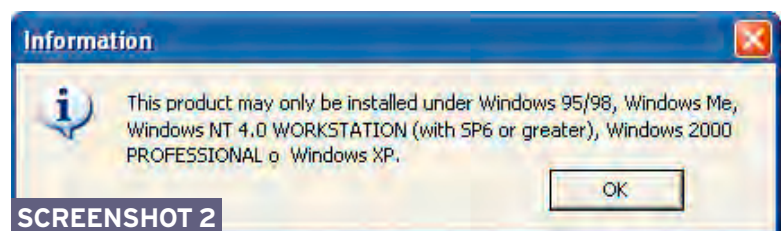
32bit and 64bit in parallel

The 32bit and 64bit versions of Windows XP can be run in parallel, keeping your existing 32bit XP installation in a multi-boot system. Just as now, the installed operating systems are managed by the Windows Boot Manager.

At the time of writing, only a few manufacturers had released 64bit versions of their programs. Avast Antivirus 4.5, Virtual Dub 1.6.3 and Winimage 7 are three

out of a handful of applications optimised for use with the 64bit version of Windows XP (see table 2). Unreal Tournament 2004 was the first game to be released commercially with 64bit code support – the necessary supplementary files are on the installation CD. 64bit versions of Far Cry, Doom 3 and Stalker: Shadows of Chernobyl are under development. The developers promise performance improvements of up to 30 per cent and noticeably better graphics.

You'll look in vain for 64bit software from big-name manufacturers such as Microsoft, Adobe or Autodesk. But demanding applications for photo editing, video editing and Cad will profit most from the operating system's 64bit architecture. Preliminary tests with specially optimised beta software showed increases in speed of 20 to 50 per cent. We don't expect it'll be long before the major manufacturers release optimised software.



32bit applications, such as virus scanners, which want to set up their own services, cause problems for 64bit Windows

Inside 64bit processors

AMD fired the starting gun in the 64bit race when it incorporated 64bit extensions into its Athlon 64 and Opteron processors long before suitable software was available. The first 64bit CPUs for the mainstream market were available at the end of 2003, supporting both 32- and 64bit code. AMD refers to this as the AMD64 architecture.

Intel is catching up and will deliver all-new processors, starting with the recent introduction of the Pentium 4 6xx series and 3.7GHz Pentium 4 Extreme Edition, with 64bit extensions. Intel Xeon server and workstation CPUs have included this technology since the middle of 2004. From a software point of view Intel's EM64T is the same as AMD64, so in theory, applications developed for AMD64 are compatible with systems using new Intel CPUs.

All quiet on the kernel front

The kernels of the new CPUs are no different from the current 32bit models. The existing 32bit architecture has simply been extended to add 64bit functionality. If the

TABLE 2: 64bit Windows XP applications

PRODUCT NAME	SOFTWARE TYPE	URL	PRICE
Avast Antivirus 4.5 Home	Virus protection	www.avast.com	Free
Dr DivX for AMD64 Beta	Video encoding	www.divxnetworks.com	N/A
Entech Power Strip 3.57	3D tuning tool	www.entechtaiwan.net	€25 (£17 approx)
Firelight Fmod 3.74 Media Player	Media player	www.fmod.org	Free
Gilles Volland Winimage 7	Copier tool	www.winimage.com	€30 (£20 approx)
Microsoft Visual Studio 2005 Beta	Programming	www.microsoft.com/vstudio	N/A
Newtek Lightwave 3D Beta	3D rendering	www.newtek.com	N/A
Pov-Ray 3.6.1a	3D rendering	www.povray.org	Free
Sisoftware Sandra Professional 2005	System analysis	www.sisoftware.co.uk	€30 (£20 approx)
Sysinternals Process Explorer 8.61	System analysis	www.sysinternals.com	Free
Tech Powerup ATI Tool 0.0.23	3D tuning tool	www.techpowerup.com/atitool	Free
Unreal Tournament 2004	3D game	www.unrealtournament.com	£30
Virtual Dub Virtual Dub 1.6.3	Video editing	www.virtualdub.org	Free
VMware Workstation Beta	Virtualisation	www.vmware.com	N/A



software does not make use of the 64bit functions, the processor runs just like its 32bit predecessor. Athlon 64 CPUs can be found in many newer PCs sold with 32bit Windows XP. The 64bit extensions only come into play after installing the 64bit version of Windows.

Don't confuse the 64bit-enabled AMD and Intel CPUs with the fully 64bit processors such as the Intel Itanium or Sun Ultrasparc series, which are based on pure 64bit architecture. These require special operating systems and only run 32bit software in emulation mode.

The existing 32bit register has been extended to 64bit width and additional 64bit registers have been added. The registers act as temporary storage during processing and for storing addresses when addressing memory. The wide registers accelerate the processing when handling data that requires more than 32 bits of storage. These include long integer or double floating point format numbers, which are frequently used in scientific or technical applications.

64bit memory addressing makes it theoretically possible to control 16 Exabytes of memory (2 to the power of 64 bits). At present only 40 bits of physical address space is used, which still allows a Terabyte of Ram to be managed. With 32bit chips, the limit of addressable memory is 4GB.

Your PC's Device Manager will highlight those devices that won't function under 64bit Windows because there's no suitable driver

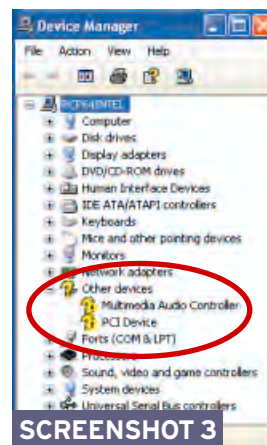
operating system, but not all the built-in components were correctly recognised and some couldn't be used (see screenshot 3). Problems occurred particularly with older and less common hardware components. Sound and network cards are good examples, but some more recent peripherals, such as printers, scanners and card readers, were also poorly supported in RC1. There were no 64bit drivers for Microsoft's own Intellitype keyboards and Intellipoint mice, which meant that special functions such as programmable extra keys couldn't be used.

As most of you will know, installation doesn't always go smoothly with brand new devices. In our tests, the Intel PC's onboard Sata (Serial ATA) controller was not properly supported. As a result, we could not even install Release

Candidate 1 without switching to an EIDE drive: the installation failed because Windows could not find a hard disk.

No guarantees

Even drivers explicitly identified as 64bit are not guaranteed to work smoothly while they are still in beta. This was demonstrated during testing with the drivers for the onboard Broadcom Net Extreme 5751 Gigabit network controller on our test PCs.



SCREENSHOT 3

The manufacturer's US homepage does list a suitable 64bit driver, but installing it caused a system crash. In this case, it was not critical because RC1 already contains a version that works.

There is light at the end of the tunnel however: both ATI and Nvidia, two of the largest graphics chip manufacturers, began to develop 64bit drivers at an early stage. Copies of 64bit optimised drivers in the Catalyst and Forceware series have been available for download from their websites for a few months. This is a sensible approach, especially as in the consumer market it is 3D games which stand to gain most from 64bit technology. Thanks to the unified driver concept, the drivers can be used with all current and older cards based on ATI or Nvidia technology. Despite their beta designation, the 64bit drivers supported all the usual features such as comprehensive quality settings and dual monitors.

For motherboards the basic drivers for current chipsets are already included in the operating system. Nvidia's 64bit beta driver (6.25 beta) for the older Nforce, Nforce 2, 3 and Pro chipsets were available for download. The main drivers for Sis motherboards are already on the 64bit XP CD. In addition, 64bit Sata, Raid, audio and network drivers for some newer chips can be obtained via the Sis home page. The same goes for Via – take a look at the Via Arena page (www.viaarena.com).

Further 64bit drivers can be found on the websites of Creative (Soundblaster Live, Audigy, Audigy 2) and other major manufacturers. Table 3 gives an overview of available 64bit drivers from various manufacturers.

Out of luck for old hardware

There won't be suitable 64bit drivers for a lot of older PC components, even after the official release of Windows XP Pro x64. For some manufacturers it is just not economically viable to develop new drivers for hardware which is no longer in production. In such cases help might be available in the form of alternative drivers

The 64bit driver question

Driver support was a problem with the 64bit beta version of Windows XP we tested for this feature. Because final development of the operating system had not been completed, the available 64bit drivers, if they existed at all, were only in beta form. Although when the final release appears there will be much wider driver support, it's worth giving you an outline of the type of problems we had.

Basic support

Basic driver support is available: both the AMD and the Intel test computers booted after installing the 64bit

How to spot 64bit processors

It's easy to spot 64bit-compatible AMD processors: all Athlon 64 and Opteron models use AMD64 technology. It's more complicated with Intel chips: there are still product groups in which CPUs are available both with and without 64bit extensions. CPUs using Intel's EM64T technology include the Xeon CPUs with the Nocona kernel – recognisable by their 1MB of Level 2 cache and 800MHz FSB (front-side bus) speed; the core frequencies are between 2.8 and 3.6GHz.

Intel launched the Pentium 4 6xx series in February 2005, and it was the first non-Xeon Intel processor to feature 64bit extensions. Now that this is available, Intel has made the situation clearer – all new Intel desktop and mobile CPUs will be EM64T-based.

Intel's next range of desktop CPUs, the recently launched Pentium D and Pentium Extreme Edition 860m, will be dual-core models and will incorporate EM64T.



Processors using 64bit technology (from left): AMD Athlon 64 and Opteron; Intel Xeon and Pentium 4 models with EM64T extensions

produced free by dedicated hobbyists, but even such emergency measures won't cover every one of the older hardware components still in use.

The situation is further complicated by the fact that at the beginning of the year Microsoft changed the rules for driver implementation on future versions of Windows. You can find details at www.microsoft.com/whdc/driver/install/64INF_reqs.mspx.

64bit Linux

Linux users have had 64bit operating systems for some time. Suitable drivers, development tools, libraries and application programs have been available since the first AMD 64bit CPUs appeared. For example, using the 64bit Linux kernel, Suse together with its compiler, assembler, linker and debugger as well as its C Library, have all been ported to 64bit architecture (see screenshot 4). However, you'll only see a dramatic leap in performance if you compile the kernel and the applications yourself. When doing this you'll need to watch out for any flags in the application's source code. For example, modules which compile outside the kernel tree need the flag `-mcmodel=kernel`.

Performance increases

If you compare a 64bit Linux distribution with a 32bit system on the same CPU, there are marked differences in speed. In particular, those programs and system functions that access the kernel directly, profit from the kernel optimised for 64bit, for example the Gcc compiler, which can – depending on the version – run up to 50 per cent faster.

Apart from Gcc, all 64bit distributions include a range of system functions and utilities which are optimised for 64bit operation, including the basic libraries, compression commands, GUIs and system commands.

Applications that require intensive processing, such as databases or 3D rendering software – MySQL and Oracle 9i or Pov-Ray, for example – profit from the optimised system environment, as do programs with a high proportion of floating-point operations. Cad applications are also speeded up. The improvement in performance achieved by the Gimp graphics suite is sensational, especially in combination with the 64bit version of Image Magick. Here, performance can be increased by up to 100 per cent. When encoding audio files into Ogg or mp3 format, performance can increase by over 50 per cent (see screenshot 5).

Although it might appear that video editing is one area certain to get a boost in performance, because many of the important standard multimedia libraries such as Ogg-Vorbis,

TABLE 4: 64bit Linux distributions

DebianGNU/Linux (Beta)	www.debian.org
Fedora Core 3 64Bit	http://fedora.redhat.com
Mandrakesoft Mandrakelinux 10.1	www.mandrakesoft.com
Red Hat Desktop and Enterprise Linux 3	www.redhat.com
Suse Linux Professional 9.2 and Enterprise 9	www.novell.com
Turbolinux 8	www.turbolinux.com
Overview of Linux distributions	www.distrowatch.com

Directfb, XMMS and Xine have already been ported to 64bit, the reality is different. Even if the video codecs are available in 64bit packages, they have not usually been specifically optimised for 64bit CPUs. As a comparison, the excellent performance delivered by the codecs in the Windows

encoding package Virtual Dub are only possible because they are written in assembler code and can therefore make full use of the CPU's capabilities. The compatibility of 64bit Linux and 32bit software has not been neglected: the older 32bit libraries remain in the system directory `lib`. Those libraries that have been ported to 64bit are stored in separate `lib64` directories.

32bit compatibility

Once the system libraries and development environments had been

ported to 64bit, the distribution manufacturers made a start on developing further 64bit applications. All the current 64bit distributions only include 32bit versions of software if a 64bit port is not possible. This is the case for some software such as Adobe Reader.

It won't be a problem for users if not every program is

64bit-capable; 32bit code will still run and experienced Linux users can compile the source code of 32bit open-source programs using 64bit optimisation tools.

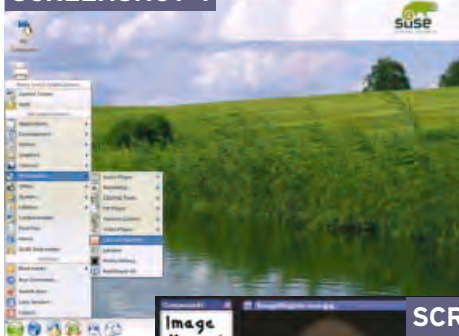
All the currently available 64bit Linux distributions are mature products and are easy to install. Table 4 above shows where you can get them. The installation interfaces and the graphical front ends of 32bit and 64bit distributions are identical.

There might have been some initial problems, such as the poor Sata hard disk support in 64bit Suse 9, but 64bit versions cause no more problems than 32bit distributions. The manufacturers' websites are the first port of call for support; they also offer help if you are not sure whether particular hardware is supported.

64bit drivers

As Linux drivers are usually modules which are integrated in the kernel, you don't normally have to install special device drivers, and the whole Linux kernel is available in a 64bit version. However for a few devices, such as some TV cards or USB devices, drivers will have to be installed manually. They can, however, be compiled and installed very easily just like the source files in a normal distribution. Only graphics cards insist on a 64bit driver, and for both Nvidia and ATI you'll have to resort to the manufacturer's 64bit optimised reference driver. That's not really a problem as both drivers give excellent performance, especially with games optimised for 64bit such as Unreal Tournament.

SCREENSHOT 4

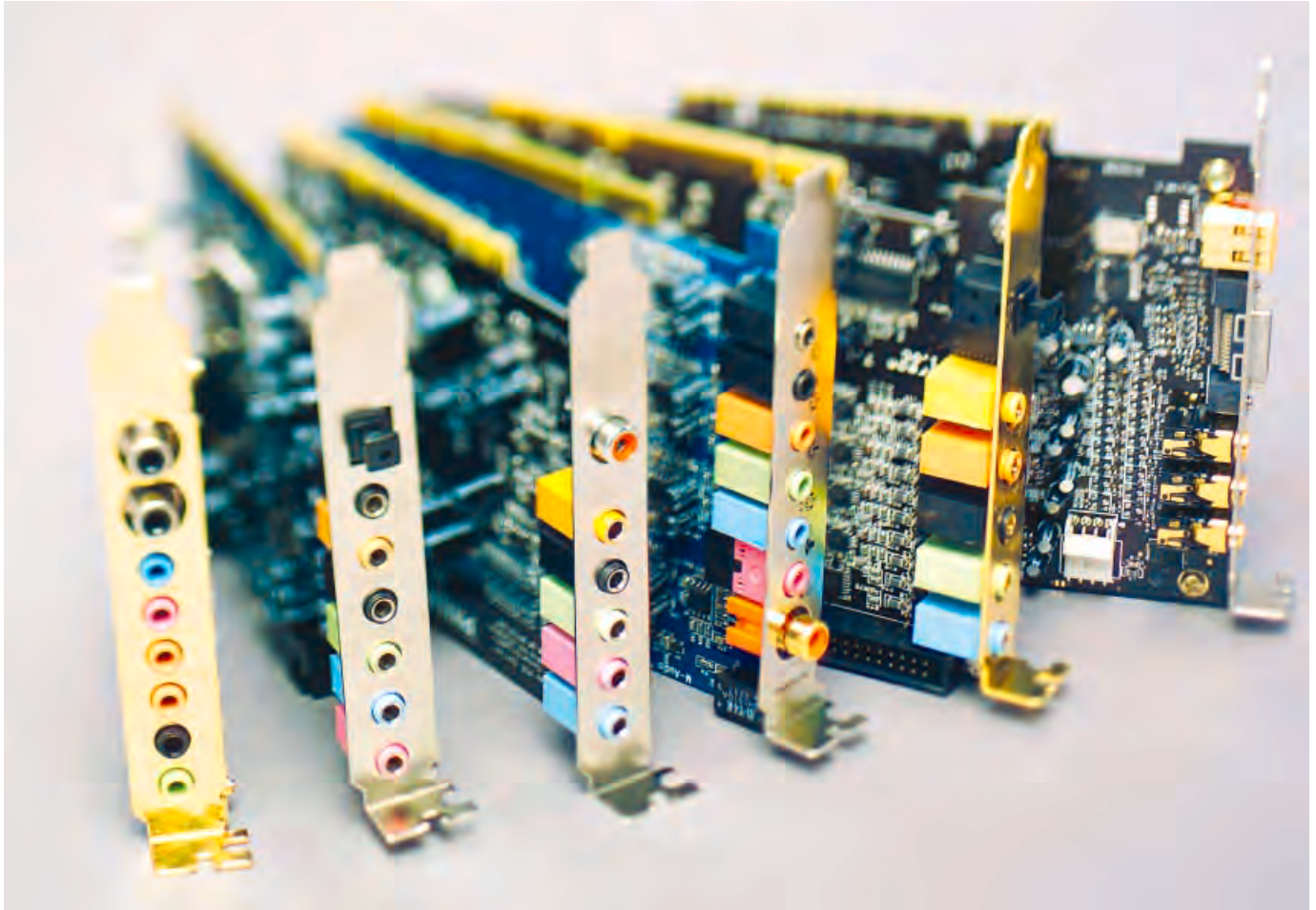


Top: Suse Linux 9.2 with KDE resembles XP but has supported 64bit for some time

Bottom: The 64bit optimised version of Image Magick runs up to twice as fast as the 32bit product

TABLE 3: 64bit drivers

MANUFACTURER	HARDWARE	URL
3Dlabs	Wildcat graphics cards	www.3dlabs.com
ATI	All Radeon graphics cards	www.ati.com/support/drivers
Creative	Soundblaster cards Live/Audigy/Audigy 2	http://preview.creativeblabs.com
Matrox	Millennium G450 graphics cards	www.matrox.com/mga/support
Nvidia	All Geforce and Quadro graphics chips	www.nvidia.com/page/drivers
Nvidia	All Nforce motherboard chipsets	www.nvidia.com/page/drivers
Realtek	RTL8169-, 8169-, 8110 network chips	www.realtek.com.tw
Silicon Image	Sata and Raid controllers	www.silimage.com
Sis	Current motherboard chips and chipsets	http://download.sis.com
Via	Current motherboard chips and chipsets	http://viaarena.com



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Sound advice

WORDS: NIALl MAGENNIS

PC audio has come
a long way since
the first beeps emanated
from an 8bit soundcard.
You can now get fantastic
audio without breaking the
bank, read on to find out how

Not too long ago, a £50 ghetto blaster would offer better audio performance than a top of the range PC costing a couple of thousand pounds.

But with the coming of the mp3 age and the increasing popularity of surround sound content in DVDs, games and mp3s, the PC has had to up its audio game.

Over the last few years, manufacturers have risen to the challenge. Nowadays 24bit audio is the norm for any soundcard and there's a plethora of surround sound speakers on the market. It's a long way from the days of cheap stereo speakers and plink-plonk soundtracks in games.

Nevertheless, many people still rely on integrated sound solutions for their audio

needs. If you're into music making, looking to build a media PC or want to get the most from gaming, a dedicated soundcard is really the way to go. Some of the cards featured here even support features such as Steinberg's Audio Stream In/Out (ASIO) for interfacing with professional audio software.

Even though the number of soundcard manufacturers is getting smaller, there are still plenty of products, so choosing the right option can be confusing. To make the decision process easier we put the top 24bit soundcards to the test. And if you're looking for a new soundcard, the chances are you're also looking for a new speaker system, so we've also included a roundup of eight surround sound packages in different price brackets.





Creative Audigy 4 Pro

Despite the name, this isn't a next generation card from Creative. Rather it's a tidy up and slight improvement on the current Audigy 2 range, with the main difference being improved digital to audio converters that give it a better signal to noise ratio.

In the box you'll find the PCI card along with the breakout box that contains most of the connectors. The breakout box is almost identical to the one supplied with the Audigy 2 Platinum Pro, but that's no bad thing as it still offers all the connectors you could need.

In fact the card is a great option for amateur musicians as it includes full size midi ports on the rear, has ASIO drivers and comes with a copy of Cubase LE.

Game performance is also exemplary as the Audigy 4's hardware acceleration keeps the load on your processor low and the EAX enhancements really do make a big difference

to the sonic realism of supported games.

The card is very expensive so it's only suitable for those who really want to make the most of the audio on their PC, but the top notch break out box and fantastic gaming audio mark it out as a cut above the rest.

DETAILS

RRP £179.99 (£153.18 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Creative 0800 376 7954

<http://europe.creative.com>

PROS Game performance; ASIO drivers; good software bundle

CONS Not that different from the current Audigy 2; expensive

VERDICT

It sounds good, has fantastic performance and a top notch breakout box. If you're serious about audio it's a great option

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



Hercules Fortissimo IV

After introducing 7.1 sound on the Fortissimo III it took a long time for Hercules to move into the 24bit age, but the company has now made the leap with the Fortissimo IV.

We liked the card's well laid out control panel as it makes it easy to set it up for gaming or surround sound playback and also offers a comprehensive range of settings to tweak performance.

When it comes to gaming, the Fortissimo puts in an impressive showing with good spatial effects. However, it's not on a par with the Audigy 4 and it does tax your CPU as a lot of the processing is done in software. Nevertheless, for such a low price the performance is good.

Music and DVD playback was also excellent, with the card producing plenty of depth at lower frequencies while still being able to handle mid and high frequency sounds. It's just not quite as crisp or musical sounding as something like the

Audigy 4 or M-Audio Revolution. Another slight downer is the fact there are no ASIO drivers supplied.

For the money this is an excellent budget buy for gamers. Its got good sound quality, decent support for gaming and is available for a bargain price.

DETAILS

RRP £44.99 (£38.29 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Hercules 0207 556 7089

www.hercules-uk.com

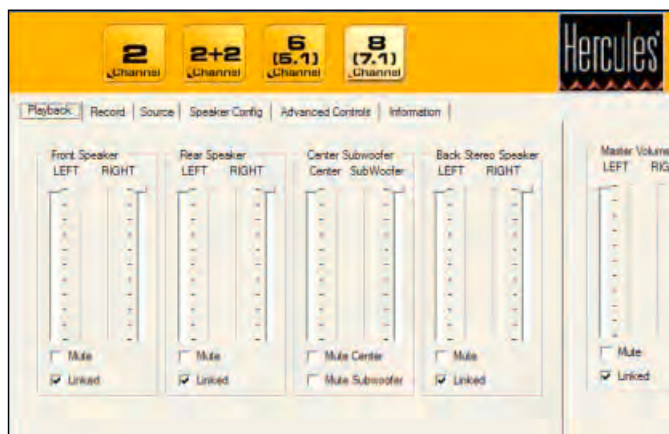
PROS Cheap; gaming performance; easy to use control panel.

CONS No ASIO drivers

VERDICT

If you're looking to upgrade your computer for gaming but don't have a great deal of money to spend, the Fortissimo IV is an excellent option

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★





M-Audio Revolution 7.1

Before launching this card, M-Audio was probably best known for producing professional audio kit for musicians. The heritage shows through here in terms of overall sound quality.

This was one of the best sounding cards in this group test as borne out in our test results. Even just listening to the card you can tell it's a cut above the rest. Music and movies sound extremely rich and with lots of subtle detail. We also liked the easy to use mixer applet and the Sensaura surround effects it provides for upmixing stereo content to 7.1-channel sound. Musicians will also appreciate the fact it comes with ASIO drivers for use in applications like Cubase SX and Reason.

However, the Revolution puts in a relatively weak performance in games. That's because the card lacks any real hardware acceleration for gaming audio standards. Also, it was worse than the Audigy 4 in terms of

surround sound placement and environmental effects.

The Revolution 7.1 is a good option for those on a restricted budget. However, gamers are probably better served with the cheaper and similarly specified, but slightly less rich sounding, Fortissimo IV.

DETAILS

RRP £99 (£84.26 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

M-Audio 01923 204 010

www.maudio.co.uk

PROS Excellent sound quality; ASIO drivers

CONS No digital input; average games performance

VERDICT

This is an excellent mid priced soundcard for those who really care about audio quality, but gamers are best served elsewhere

FEATURES

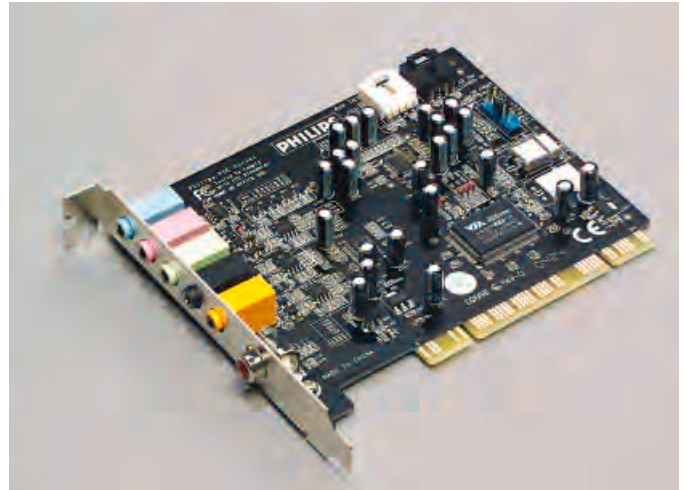
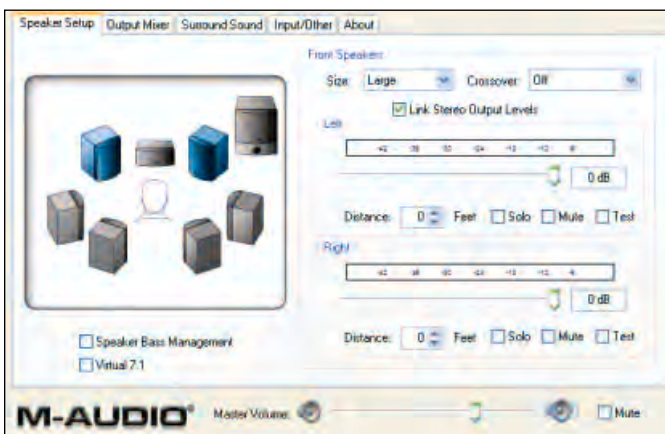
★★★★★

★★★★★

★★★★★

★★★★★

★★★★★



Philips Ultimate Edge PSC724

Philips' Ultimate Edge card is built around the Envy 24 GT processor, which is a lower end version of the chip found in the M-Audio and Hercules cards. The result is you only get 5.1 output and the maximum playback frequency is limited to 96KHz.

Philips is marketing this card at those who want to use it for listening to music. As a result the control panel features a number of sound enhancement options using QSound Labs' technology to add some of the detail back into compressed music files. These include effects for upmixing stereo sources to 5.1, high frequency enhancers and bass extenders. The effects work well, but many software mp3 players will offer similar features.

The card's overall sound quality is good, but it's not in the same league as the M-Audio or Audigy 4. Also, it's not such a hot performer in games as it relies on your CPU for much of its surround processing and the

surround effects are pretty average. Musicians will be disappointed too as there are no ASIO drivers supplied.

It may be Ultimate Edge by name, but it's not cutting edge. The main problem is that it's outclassed by cheaper products from rival manufacturers.

DETAILS

RRP £49.99 (£42.54 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Philips 020 7949 0069

www.philips.co.uk

PROS Lots of effects you can apply to compressed music

CONS Lacklustre gaming performance; low on features

VERDICT

For the money, this card doesn't offer the features we'd expect. A bit of a mediocre showing from Philips

FEATURES

★★★★★

★★★★★

★★★★★

★★★★★

★★★★★





Terratec Aureon 7.1 Universe

This card is a replacement for the DMX 6Fire that was much loved by musicians. However, since then Creative has moved forward with the Audigy 2 and 4, but has Terratec managed to keep pace?

The package comprises a PCI card and a breakout box that slides into a spare 5.25in. drive bay. The bay feels solid and well made, but it's not as pleasing to look at as similar offerings from Creative.

Nevertheless, the Terratec has some interesting features, including a built-in phono preamp to connect a record deck to make mp3s of albums. The card also comes with ASIO drivers for use in applications like Cubase SX. Midi in and out sockets are provided via a daughter card, so it's a good option for musicians.

The overall sound quality was excellent. We liked the tight bass and found it offered plenty of detail in the mid and high ranges. For gaming, the Aureon puts in an admirable performance, but

we still thought the EAX HD features on the Audigy 4 produced richer and more detailed sonic environments.

The Aureon 7.1 is a good card for musicians, but gamers and movie fans would be better off with the slicker Audigy 4 package.

DETAILS

RRP £149.99 (£127.65 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Terratec 0870 458 0011 (Eurotech)

www.terratec.net

PROS Built-in phono preamp; ASIO drivers

CONS Ugly drive bay box; not as good for gaming as the Audigy 4

VERDICT

We wouldn't recommend this card over the Audigy 4 for gamers or casual users, but musicians may find its features tempting

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL



Trust 714DX 7.1 Sound Expert

Unlike all the other products in this test, this isn't really a fully featured 24bit card. It plays back 24bit audio at sample rates of up to 96khz, but it can only record at 16bit resolution.

For most people this will not be a big issue as you don't use the recording features when playing games, listening to music or watching DVDs. However, it does count the card out for musicians and this point is further hammered home by the fact there are no ASIO drivers available for use in applications like Reason and Cubase SX.

On the plus side Trust has managed to kit the card out with a digital input as well as an output so it's relatively well connected.

However, in terms of sound quality the card is certainly a step below the other products in this test. While it looks like it puts in a decent performance in gaming thanks to its relatively

low CPU usage, the reality was that the surround effects it produced were below par.

This offering from Trust may be attractively priced, but the truth is that other budget cards such as the Fortissimo IV from Hercules blow it away in terms of sound quality.

DETAILS

RRP £29.99 (£25.52 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Trust 0845 6090 036

www.trust.com

PROS Relatively low CPU usage in games; digital input

CONS Doesn't record at 24bit resolution; below par performer

VERDICT

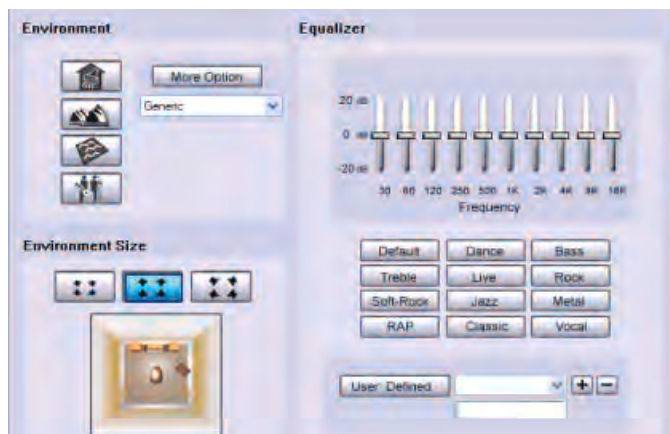
This is a budget card, but for a little extra outlay you can get a card with much better performance

FEATURES

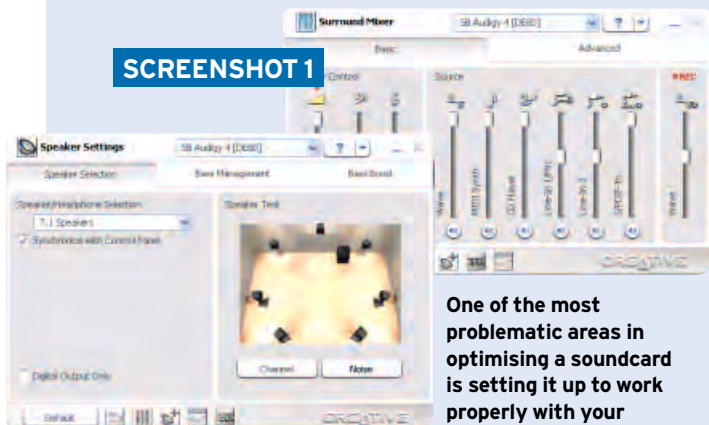
PERFORMANCE

VALUE FOR MONEY

OVERALL



Optimise your soundcard for DVD movie playback

SCREENSHOT 1


One of the most problematic areas in optimising a soundcard is setting it up to work properly with your speakers and software DVD

player. It might seem like a simple task, but often there are so many different places to select your speaker set up, control volume levels and turn on and off virtual surround effects, that it's easy to become confused.

Let's take the settings for the Audigy 4 card we've reviewed as an example. To set it up properly to work with a 7.1 speaker system you need to start by running the Creative Surround Mixer from the Programs menu.

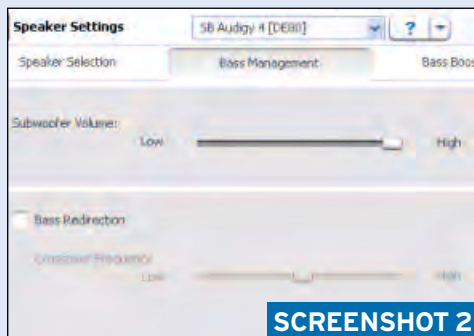
Once this has loaded, you then have to click on the Speaker icon at the bottom of the mixer window.

This will open the Speaker Settings applet. From the Speaker Selection drop

down box you need to select the 7.1 option (see screenshot 1).

Below this there's a tick box marked Synchronise with Control Panel. Make sure this is ticked as it means the settings in this screen will always match those in the Speaker Settings section in Windows' audio Control Panel applet – something that some drivers don't do and which can lead to great confusion.

If you now tick the Bass Management tab you'll see a slider control that allows you to set the subwoofer volume level (see screenshot 2). This merely replicates the subwoofer volume slider


SCREENSHOT 2

SCREENSHOT 3

would usually go to your subwoofer and re-direct them to your satellite speakers. It's a useful tool to have because it allows you to turn off your subwoofer, but still get a decent helping of bass through your satellites for late night gaming sessions.

Once you're finished with these settings click on the Close button to return to the Surround Mixer applet. Now click on the EAX Console

button at the bottom of the Surround Mixer window. When the EAX Console opens make sure all the EAX effects are turned off.

You can use the Creative CMSS 2 effect to add some width to surround sound movie soundtracks, but we prefer them with this setting turned off (see screenshot 3). Once you've finished tweaking these settings click on the close button and return to the Surround Mixer. In the Surround Mixer if you click on the Advanced tab you'll see the mixer sliders that allow you to control the level of each speaker in your setup (see screenshot 4).

Usually you can leave these at their default value, but if you're got a large room, for example, you may want to increase the level of the rear speakers relative to the other satellites in your set-up.

Now start up your DVD player application and open the configuration menu. For example, in PowerDVD you click on the tools icon to open the configuration screen. Under the Audio tab you'll see two boxes.

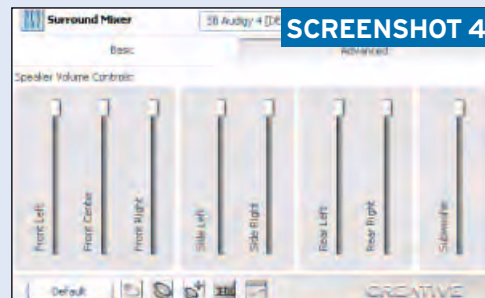
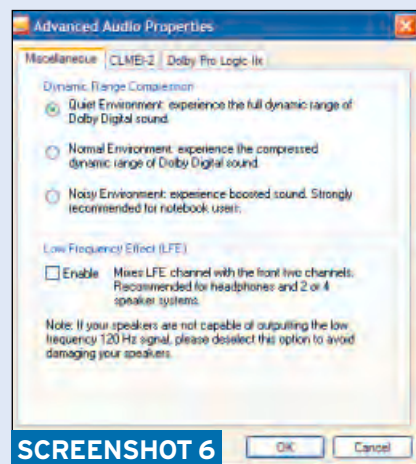
In the Speaker Environment box select 7.1 from the drop down list and in the Output Mode select No Effect (see screenshot 5).

Now click on the Advanced button and select Quiet Environment to turn off dynamic range compression of the Dolby Digital signal (see screenshot 6).

You're now all set up to enjoy surround sound in your DVD movies or DVD-Audio discs. All drivers and DVD playback packages vary, but the basic principle's the same – try and get the sound from the source to the speakers with minimal unwanted interference from the playback software or drivers. If you're still having problems with surround sound playback you could have an issue with your soundcard's drivers.

It's always a good idea to update your drivers immediately as those from the box may already be out of date.

Manufacturers often update their drivers to improve performance. Updated drivers, for example, may lower the level of strain a card puts on your CPU during game play or improve compatibility with music making applications.

SCREENSHOT 4

SCREENSHOT 5

SCREENSHOT 6



LOWEND



Logitech X-530

For a set of speakers that costs only marginally more than a night out in London, this 5.1 package from Logitech manages to look very classy. The kit is also easy to hook up to your soundcard thanks to the colour coded connectors.

Amazingly the speakers manage to sound remarkably good considering their low price. The satellites have enough mid range to avoid sounding overly tinny and the subwoofer blends in plenty of meaty bass.

The only down side is that the cables aren't very long and as they're moulded to the speakers you can't easily replace them. The result is this kit is only really suitable for placing quite close to your PC.

However, we'd still heartily recommend this set as the sound quality it provides way exceeds the asking price. All in all, it's a bit of a bargain.

RRP £59.99 (£51.06 ex VAT)

PRODUCT INFORMATION Logitech 0207 309 01 27 www.logitech.co.uk

PROS Great sound quality for the price; sleek design

CONS The speaker cables are a bit short

★★★★★

LOWEND



Philips MMS460

With its aggressive looking satellites this 5.1 set from Philips has quite a 1980s look to it. The surround speakers feel quite heavy and look like they should be capable of pushing out a fair bit of mid range, but in reality they sound extremely tinny.

In fact when listening to music the excessive treble quickly becomes tiresome on the ears. Games fair a bit better with the high frequency bias helping to add plenty of directional information to game audio, but you really don't get much kick from explosions or gunfire because the subwoofer simply hasn't got the power to cope.

As a result we can't really recommend this system. It might have the lowest price of any of the sets in this test, but unfortunately it also sound cheap.

RRP £55 (£47 ex VAT)

PRODUCT INFORMATION Philips 020 7949 0069 www.philips.co.uk

PROS Retro design

CONS Satellites sound too tinny; sub lacks kick

★★★★★

LOWEND



Terratec Home Arena 5.1

The satellites in this system feel very solid because Terratec has chosen to make them out of wood rather than the more usual plastic.

With their tight mid-range and controlled high-end performance they sound good too and the subwoofer backs them up with a meaty rumble.

However, the system is not without its negative points. The main problem is that Terratec has decided to do away with a wired controller and instead just provide an infrared remote control.

Unfortunately the company has placed the infrared receiver on the subwoofer, which means you can't hide it out of sight, because if you do you won't be able to control the system's volume.

It's a real shame, because with a better control setup this could have been a very tidy package with an attractive price.

RRP £59.99 (£51.06 ex VAT)

PRODUCT INFORMATION Terratec 0870 458 0011 (Eurotech)

www.terratec.net

PROS Good build quality; pleasing sound

CONS Placing the remote receiver on the sub is ludicrous

★★★★★

MIDRANGE



Altec Lansing VS3151R

If there was an award for how easily a speaker package could be set up this 5.1 system would win. Not only are the connectors colour coded, but there are also grooves cut into the sides of the sockets and connectors to make setup idiot-proof.

As well as the wired controller the system also comes with an infrared remote control for setting the volume levels and there's an auxiliary input for hooking up a CD or mini disc player.

It's a shame though that the satellites are a bit of a let down. They produce too much treble and not enough mid range leading to an unbalanced sound field. So although this is a well thought out package, it unfortunately doesn't have the sonic pedigree to really stand out at its current price.

RRP £79.99 (£68.08 ex VAT)

PRODUCT INFORMATION Altec Lansing 0870 458 0011 (Eurotech)

www.euro-tech.co.uk

PROS Easy to set up; infrared remote control

CONS Satellites have too much treble

★★★★★

MIDRANGE

Creative Inspire T7900

In truth 7.1 surround sound systems are not for the faint hearted. If you're not careful you'll end up with such a mess of wires that your room will look like a BT phone exchange.

The other issue is that manufacturers often skimp on the quality of the satellite speakers in 7.1 systems, but thankfully that doesn't seem to be the case here, although Creative has used different speakers for the front three speakers.

Usually this leads to unbalanced sound in a surround set up, but at this price point it comes across as a good compromise. However, we weren't so keen on the cheap and nasty looking control unit.

On the whole, though, this is a surprisingly good sounding system for a 7.1 kit in this price range.

RRP £99.99 (£85.10 ex VAT)

PRODUCT INFORMATION

Creative 0800 376 7954

<http://europe.creative.com>

PROS Cheap for a 7.1 system; good overall sound quality

CONS Front speakers are different to rears; cheap control unit

★★★★★

MIDRANGE

Hercules XPS5-101-Black

In terms of build quality this is the best system on test as the satellites are made out of a combination of metal and heavy-duty plastic.

The system is relatively easy to set up with the majority of the leads clearly marked. The package comes with a small pendant shaped remote control that gives you fantastic control over the system with individual buttons for controlling the subwoofer, surround sound volume and master volume settings.

In terms of sound quality the system puts in an admirable performance. The satellites have plenty of power and enough mid range to create a satisfyingly rich sound, while the sub is suitably meaty, although at times it can sound a little bit artificial.

Nevertheless this is still good system that has produces a rich soundscape, has lots of power and is built to last.

RRP £99.99 (£85.01 ex VAT)

PRODUCT INFORMATION Hercules 0207 556 7089 www.hercules-uk.com

PROS Excellent build quality; good sounding satellites

CONS Sub can sound a touch artificial at times

★★★★★

HIGHEND

Creative Gigaworks S750

This 7.1 set from Creative is expensive, but thankfully it has the performance to justify the high price tag.

For your money you get seven satellites that feel well built and, although boring to look at, certainly pack a significant sonic punch. The satellites not only handle high frequency material well but also have plenty of mid range poke and we like the way the subwoofer blends in nicely giving the whole system very smooth performance.

Music sounds natural and well-balanced and game audio is suitably in-your-face. However, the control unit Creative supplies is ugly and far too basic for a system costing this much.

Overall, though, this is a superb sounding system. It's expensive, especially for a PC package, but it really does do music, movies and games justice.

RRP £329.99 (£280.84 ex VAT)

PRODUCT INFORMATION

Creative 0800 376 7954 <http://europe.creative.com>

PROS Smooth sounding audio; well-built speakers

CONS Control unit is very basic; bland satellite design

★★★★★

HIGHEND

Logitech Z-5500 Digital

Unlike all the other speaker kits in this test, this set-up from Logitech includes a hardware decoder for Dolby Digital and DTS signals. Of course, you're unlikely to use this with your PC, but it does mean you can hook up a PS2 or Xbox to the system and enjoy proper surround sound.

Given the price you'd expect this kit to be no slouch in the sonics department and on the whole it does deliver. There's a good balance between mid and high frequencies sounds in the satellites and they blend well with the sub to give pleasingly rich audio for music. However, we weren't keen on the design of the main control panel as it's big and blocky.

Overall, though, if you're looking for a good sounding system that you can also use with your PS2 or Xbox, this is a sensible option.

RRP £279.99 (£238.29 ex VAT)

PRODUCT INFORMATION Logitech 0207 309 01 27 www.logitech.co.uk

PROS Built in Dolby Digital and DTS decoder

CONS Ugly control unit

★★★★★

The future of PC audio

Predicting the future of audio on PCs is a difficult task as, at the moment, it is really moving in two directions at the same time.

On the one hand the music industry is pushing audio quality backwards. We've gone from buying CDs to purchasing music online that's encoded using lossy compression schemes such as wma and aac.

On the other hand the movie industry is pushing in the opposite direction. It's already introduced us to surround sound via the likes of the Dolby Digital and DTS formats and, with the launch of the next generation of DVD technology (HD-DVD and Blu-Ray), it wants to push us towards high-resolution 24bit audio.

The reality is that those in the PC market need to make their products work well on both fronts, especially as the PC is likely to play a much more prominent role in living room in years to come.

To ensure all new PCs can handle the next generation movie and music formats, Intel is already pushing its HD audio specification for onboard audio, but this is only the beginning of its strategy for onboard audio. In fact the company is already looking at how it can improve the way PCs integrate with other audio devices. It is planning on equipping its integrated sound

Microsoft and Intel want the PC to become the entertainment hub for high definition audio and video



chips with Adat interfaces. The Adat standard is an optical interface that's capable of carrying eight channels of uncompressed high definition audio between devices such as a PC and a surround sound amp.

Intel wants the PC to take care of all audio DSP functions, such as surround sound decoding, and then have it simply pass the audio on to an amplifier via a clean optical connection. In fact it has already demonstrated the technology using a prototype Adat-enabled amplifier from a company called Sonic Focus.

It all fits in neatly with Microsoft and Intel's plan for the PC to move into the living room and take over as the device we use to watch or listen to high definition content.

But, when the content is stored on one PC in a central location, consumers are going to demand a way to access that content in different rooms in their homes. Many upmarket apartments come with expensive multi-room audio systems that can channel a variety of music tracks to different rooms in the home at the same time. You can achieve a similar thing at present using a PC with Wifi streaming appliances, but devices use different pieces of software and there's no real way to manage them all from a signal interface. We reckon sorting these issues out will lead to multi-room audio becoming a standard feature of PC-equipped homes in the future.



New formats such as HD-DVD will feature high-resolution 24bit audio

Why 24bit?

For years PCs were a bit of a joke when it came to audio. Even when 16bit soundcards were introduced the quality of the audio they produced was far from ideal, as the cards were hamstrung by poor digital to analogue converters.

It's only now with the arrival of 24bit cards that PCs can truly claim to have cutting edge sonic performance. However, the benefits of these 24bit cards are not immediately obvious to non-audiophiles. Many people question why soundcards need to be capable of playing 24bit signals when CDs are only recorded at 16bit quality and most games also still use 16bit samples for music and sound effects.

To appreciate the benefits we first need to understand a small amount about audio bit depths and sampling rates. Digital audio is captured in snapshots that are then played back quickly one after the other, very much like how film captures movement. In film, the larger the frame being captured, the more detail there is in the image, so a 35mm film is much sharper than a 16mm film. Similar in audio a 24bit snapshot of the audio contains more information than a 16bit one. Also, in film, the more frames captured per second, the more fluid the motion seems. In audio the frames per second correspond to the sampling rate. A sampling rate of 96KHz sounds smoother than a sampling rate of 44.1kHz.

Essentially 24bit audio captured at high sampling rates is much closer in nature to the analogue waveform it is trying to capture. In fact 24bit audio at 96KHz has almost 250 times the resolution of a 16bit 44.1KHz file. However, just because more information is being captured, it doesn't mean the difference is obvious to

everyone - it's a much more subtle change, like the difference between an original CD and an mp3 version of the same song.

At present there isn't a lot of content around that can take

advantage of the abilities of the latest 24bit cards. In fact the only real high definition audio material you can play on your PC comes on DVD-audio discs. To play these you'll need a suitable software decoder program for your soundcard, such as those with the Audigy 4 or incorporated in PowerDVD 6 Deluxe. The DVD-audio standard is a next generation replacement for CD technology. The discs contain sound recorded at up to 192KHz/24bit, but at present the format isn't well supported partly because it's in a format war with Sony's SACD, another high resolution audio format that isn't currently supported on PCs.

In the future we'll be seeing more media

around with high-resolution sound, as both Blu-Ray and HD-DVD will make use of it. In the meantime if you want to make the leap to 24bit audio, think about the speakers you are going to use. If you want to hear the benefits of 24bit audio you need to match your soundcard with a speaker system with a dynamic range and frequency response that can do justice to the sonics it is capable of producing.

Future standards such as Blu-Ray will use 24bit audio for movie soundtracks



The Audigy 4 can play DVD-audio discs



Results

TEST	CREATIVE AUDIGY 4 PRO	HERCULES GAMESURROUND FORTISSIMO IV	M-AUDIO REVOLUTION 7.1	PHILIPS ULTIMATE EDGE PSC724	TERRATEC AUREON 7.1 UNIVERSE	TRUST 714DX 7.1 SOUND EXPERT
Noise level (dB(A))	-97.6	-95.1	-97.2	-67.6	-95.1	-79.1
Dynamic range (dB(A))	97.6	94.2	94.6	94.2	95	77
Total harmonic distortion (THD) %	0.0019	0.0089	0.0015	0.0052	0.0053	0.028
Intermodulation distortion (IMD) %	0.0053	0.014	0.0065	0.781	0.009	0.044
Stereo crosstalk (dB)	-96.6	-90.7	-95.3	-90.9	-85.8	-80.8
Directsound 3D hardware CPU utilisation (%)	5.1048	16.1326	14.4874	19.1534	12.7716	10.7945
Directsound 3D + EAX CPU utilisation (%)	5.0697	19.4239	21.5746	22.6329	16.8108	16.5186
Comments	The Audigy 4 has exemplary dynamic range and a very low noise floor, leading to a clean sounding audio. The hardware acceleration for gaming also means it hardly taxes the CPU.	Considering its low price, the Fortissimo puts in a stellar performance in terms of audio quality. It does tax the CPU somewhat during gaming, but not much more than cards costing double the price.	The relatively high load the Revolution puts on the CPU means it's not ideal for gaming, but its low noise floor and resistance to cross talk mean it's a good choice for audiophiles.	For a 24bit card, the Ultimate Edge puts in quite a disappointing performance. The noise floor is quite high and the CPU takes quite a hit during gaming.	In terms of audio quality the Aureon 7.1 is an impressive performer thanks to its low noise floor and minimal stereo crosstalk. The CPU usage in gaming is also relatively low.	The Trust only has 16bit recording and as we tested all the cards in Rightmark's loop back mode these audio quality results represent its 16bit performance only. The only real plus point is the low CPU usage.

How we tested

All the cards were tested on a 2GHz Pentium 4 machine with 512MB of Ram. We tested the audio performance of the cards using Rightmark Audio Analyzer 5.4 (<http://audio.rightmark.org>) in loop-back mode. The 3D gaming performance was tested using Rightmark 3DSoundbench 1.30.

Below is a brief explanation of the tests listed above:

Noise: The electrical noise level generated by the card's circuitry in the absence of a signal. Lower figures are better.

Dynamic range: The ratio between the quietest and loudest sounds the card can differentiate. For a 24bit card, the theoretical value is 144dB - the figures measured show the effect of the card's electronic noise on this figure. Higher figures are better.

Total harmonic distortion (THD): This is a measure of the purity of playback of a single frequency test signal (1000Hz). The result is calculated as a percentage of the power of the test signal, with low figures being better.

Intermodulation distortion (IMD): Similar to the THD measurement, but using two test signals (60Hz and 7000Hz) and measuring the percentage distortion. Lower figures are better.

Stereo crosstalk: A measure of the electrical isolation between the left and right stereo channels - lower figures are better.

Directsound 3D hardware CPU utilisation: A test that measures the strain put on the CPU when playing back Directsound 3D. Lower figures are better.

Directsound 3D + EAX CPU utilisation: Similar to the the previous test, but adding EAX environmental effects into the playback.

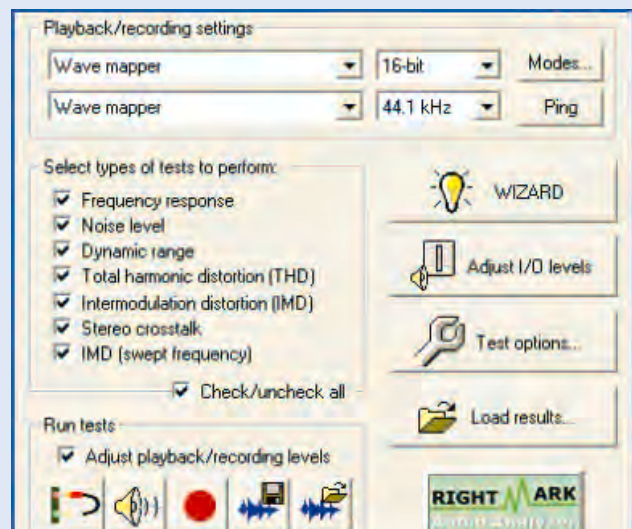
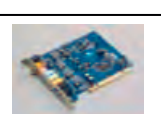
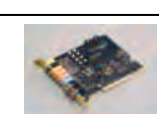




Table of features

	 EDITOR'S CHOICE PERSONAL COMPUTER WORLD	 HIGHLY COMMENDED PERSONAL COMPUTER WORLD				
MANUFACTURER	CREATIVE	HERCULES	M-AUDIO	PHILIPS	TERRATEC	TRUST
MODEL	AUDIGY 4 PRO	FORTISSIMO 4	REVOLUTION 7.1	ULTIMATE EDGE PSC724	AUREON 7.1 UNIVERSE	714DX 7.1 SOUND EXPERT
Price inc VAT (ex VAT)	£179.99 (£153.18)	£49.99 (£38.29)	£99 (£84.26)	£49.99 (£42.54)	£149.99 (£127.65)	£29.99 (£25.52)
Telephone	0800 376 7954	0207 556 7089	01923 204 010	020 7949 0069	0870 458 0011 (Eurotech)	0845 6090 036
URL	http://uk.europe.creative.com	www.hercules.com	www.maudio.co.uk	www.philips.co.uk	www.terratec.net	www.trust.com
Analogue outputs	8	8	8	6	8	8
Analogue inputs	2x1/4in jack, 1 x stereo phono	1 x mini jack mic input, 1 x mini jack line input	1 x mini jack mic input, 1 x mini jack line input	1 x mini jack line in, 1 x mini jack mic in	1 x stereo phono input (with phono pre-amp), 1 x stereo phono line in, 1 x 1/4in jack mic input	1 x mini jack mic input, 1 x mini jack line input
Bit depth	24bit	24bit	24bit	24bit	24bit	24bit playback/16bit recording
Max sampling rate supported	192khz	192khz	192khz	96Khz	192khz	96khz playback/481khz recording
SPDIF digital (coaxial) I/O	✓	✓ (out only)	✗	✓ (out only)	✓	✓
Optical digital I/O	✓	✗	✓ (out only)	✗	✓	✗
Gaming surround formats supported	EAX, EAX 4 Advance HD, Open AL, Directsound	EAX 1 and 2, Directsound	EAX 1 and 2, Directsound	EAX 1 and 2, Directsound, Qsound, Aureal 3D	EAX 1 and 2, Directsound, Sensaura 3DPA	EAX 1 and 2, Aureal 3D, Directsound
IR remote control	✓	✗	✗	✗	✓	✗
ASIO drivers	✓ (2.0)	✗	✓ (2.0)	✗	✓ (2.0)	✗
SCORES						
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

Editor's Choice

PC audio has advanced incredibly over the last few years. Whereas before we were stuck with anaemic sounding speaker systems and soundcards that struggled to match the audio you'd expect from a decent hifi, the move to 24bit soundcards and surround sound speaker systems means you can kit your PC out with great sonic sounds without breaking the bank.

Soundcards

We decided to give our **Highly Commended** award to a card that manages to offer great quality audio at a bargain price. The **Hercules Fortissimo IV** may not have the same level of performance as the M-Audio Revolution 7.1 or the Audigy 4, but for the price it still sounds fantastic.

However, the overall winner and the recipient of our **Editor's Choice** award is the **Creative Audigy 4 Pro**. Granted, the card is a reworking of the Audigy 2 range, so it's not the massive step up most were expecting,



Creative Audigy 4 Pro



Creative Gigaworks S750

but the sheer range of features makes it a real winner. There's nothing on the market at the moment that can match its mix of top-notch audio quality, fantastic connectivity and brilliant gaming credentials. It may be expensive, but if you want the best sometimes you have to pay for it.

Speakers

Creative also managed to scoop our **Editors Choice** award for speaker systems. The **Creative GigaWorks S750** is also a bit of a wallet drainer, but again it offered the best sound quality of any of the systems on test. What impressed us most was the smooth cross over between the bass rumble of the subwoofer and the mid range and high frequencies from the satellite speakers.

We also decided to give a **Highly Commended** award to **Logitech's X-530** speaker set. This package really impressed us with the level of sound quality at such a low price point.



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Perfect packages

WORDS: RORY REID TESTING: VNU LABS

Many manufacturers offer enticing extras with new PCs, but is buying a machine based on its glamorous peripherals a good idea or a big mistake? We compare the quality of six PC bundles

Buying a new PC is quite straightforward in theory. You weigh up the price and specification of each potential machine and make a decision based on your individual needs. Things get a little more complicated, however, when manufacturers try to entice users by including a heap of bundled peripherals.

Suddenly that extra 512MB of Ram becomes less important, as the prospect of a bundled digital camera, printer or mp3 player begins to influence your decision. But do consumers always get a good deal when buying a PC flanked by external peripherals?

In our experience, things aren't always as good as they seem. The quality of many of the extras advertised with new PCs often

add very little value to the overall package, and in some cases they can even reduce it.

Many adverts seen in newspapers or on the high street will offer PCs with a free printer, for example, but not all printers are created equally. By substituting an important internal component for more glamorous but ultimately substandard inclusions, manufacturers can easily sway your judgment.

With this in mind, we asked six vendors to supply PCs costing under £1,000 including VAT. The only caveat; they had to include at least two peripherals in the bundle.

As you'll see over the next few pages, the quality and focus of these submissions varied considerably between our entrants. Read on to learn whether there really is a deal out there worth snapping up.





Evesham Nforce GT

Aesthetically, the Nforce GT is a far cry from some of the Evesham PCs we've seen recently. The plain ATX case may appeal to users who like under-stated designs, but others may prefer something a little bolder.

The Nforce GT isn't particularly exciting on the inside either. Its 160GB Western Digital hard drive provides a fair amount of storage, but it pales in comparison to the 250GB drives in the Mesh and Tiny submissions. We'd estimate it can store around 50 hours of high-quality video, but if you regularly install large applications such as games or have a substantial digital music collection, you may find this space inadequate. If your needs are more modest, though, 160GB will be fine.

The Athlon 64 3200+ CPU at the heart of the PC is competent, but it is among the slowest in the group. It can handle almost anything asked of it, but some users may prefer the reassurance of a faster processor. Likewise, this PC's 512MB of Ram is adequate for most tasks, but if you're planning to run demanding applications such as video editing, an extra 512MB would be handy.

We were more impressed with the Nforce GT's 3D gaming performance. Its Geforce 6600GT graphics card returned

the highest 3Dmark 2005 score of the group and also delivered strong frame rates in Far Cry.

Unfortunately this PC is let down by its accompanying peripherals bundle. Evesham has chosen an Epson Stylus CX3600 multifunction device and a portable audio player. The former is a budget offering that produces fairly good (if slow) results, but the latter, a 256MB X-Micro EVA MP3 Player, has a small capacity and is best suited to short commutes or people who jog.

On the whole, the Nforce GT is a good all-rounder. However, it doesn't really stand out in any particular area and its bundled peripherals aren't as exciting as others in this group.

DETAILS

RRP £999 (£850.21 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Evesham
0870 160 9500

www.evesham.com

PROS Multifunction printer

CONS Low value peripherals

VERDICT

Lacks the speed of the Mesh submission, but a good all-round multimedia PC

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



Jal Tacita

Motherboards that use an ATI chipset have been comparatively thin on the ground, but the Jal Tacita is one of three PCs in this group that uses one. Even more unusual is the fact that its Radeon Xpress 200 chipset is housed on a motherboard from Optronix – a company that started operations in the UK as early as 2003.

Having never seen the Optronix OP-K9A200G-MLF motherboard before, we were quite eager to see what it was capable of and we are pleased to report it has a number of strong features. Five-channel audio is included, as is an onboard Radeon X300 graphics card, but this has been disabled in favour of a more powerful Nvidia Geforce 6600GT.

Users with a large number of existing internal components will also be pleased to note that the OP-K9A200G-MLF has arguably the best upgrade potential in the group, thanks to a large number of USB, PCI and PCI Express connectors.

The Athlon 64 3200+ CPU used by Jal isn't the fastest here, but the PC gets a slight edge over the similarly equipped Watford and Evesham submissions as it is paired with twice as much memory (1GB of DDR400 Ram). It also stands out thanks to its excellent 19in Viewsonic VX912 monitor – the best in this group.

Jal has also included a strong peripherals bundle. It is the only PC in the group that has a digital TV tuner – an Avermedia AverTV DVB-T USB. This useful inclusion lets you watch Freeview television and is HDTV-compatible, but make sure you live in an area with strong digital TV reception, as you may not be able to make the most of it.

Slightly more practical is the bundled Epson Stylus Photo R200 printer. This lacks the scanning and copying abilities of some of its rivals, but it produces arguably the best photos here.

If you're after a PC that has decent performance, good upgrade potential and some interesting peripherals, the Tacita is a great choice.

DETAILS

RRP £999 (£850.21 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Jal
08707 525 810

www.jal.co.uk

PROS Digital TV tuner; monitor

CONS No scanning capability

VERDICT

A good all-round PC with some interesting and usable peripherals

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



Mesh Matrix Prestige Connect

The Mesh Prestige Connect has the most impressive specification of the group. Power users will be attracted by the Athlon 64 3800+ CPU and 1GB of DDR400 memory, but the impact of this combination is reduced somewhat because of Mesh's use of an Asus AV8 Deluxe motherboard. This has proved a solid foundation in many past reviews, but users with a keen eye for technology will be justifiably concerned that it lacks compatibility with newer PCI Express hardware.

Despite this, the Prestige Connect achieves strong performance. It's Sysmark 2004 score of 196 is by no means the quickest we've seen, but it is a respectable tally given that it is 10 per cent higher than its nearest competitor in this group.

Multimedia performance was also very strong. Mesh has opted for an Nvidia Geforce 6600GT graphics card with 128MB of memory. This isn't as quick as the ATI Radeon X800 in the Watford submission but, thanks to the aid of a fast CPU, it achieves the best Far Cry frame rates of the group.

With such a potent core configuration, Mesh has had to make several compromises to keep costs down and meet our brief. The Prestige Connect is accompanied by a seven-port USB

hub and a Logitech Premium stereo Bluetooth headset. The latter is accompanied by 120-minutes of Skypeout calls (worth just under £2), a service which lets users make free or reduced-rate phone calls via the PC. As useful as this is for some users, we found it easier to get excited about the camera and photo printer bundles seen elsewhere.

The Prestige Connect is an attractive proposition for performance users. If you already own some of the peripherals seen elsewhere in this group, its high specification makes it a worthwhile investment. However, many users, ourselves included, may prefer a slightly slower PC offset by better peripherals.

DETAILS

RRP £999 (£850.21 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Mesh

0870 046 4747

www.meshcomputers.com

PROS Fast CPU and ample memory

CONS Low-value peripherals

VERDICT

Good all-round performance, but let down by some fairly uninteresting accessories

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★



Nethighstreet NetPCW 999

Nethighstreet's last submission to a PCW group test had a definite gaming focus and that trend continues with the NetPCW 999. Its Geforce 6600GT graphics card is an identical card to that chosen by many vendors in the group, but it manages better 3D performance than most thanks to the backing of a quick Athlon 64 3500+ CPU.

Its single stick of 512MB of Ram is a sufficient, if not particularly reassuring amount of memory. Nethighstreet's use of the MSI K8N-Neo 4 motherboard gives this PC lots of upgrade potential. Three unoccupied Dimm memory slots allow up to 3.5GB of Ram to be installed.

The K8N-Neo 4 contributes to the PC's gaming with onboard 7-channel sound. This produces great audio through the bundled 5-channel Creative Inspire P5800 speakers, but we would have preferred a 7-channel set.

Our opinion of the NetPCW 999's peripherals bundle was somewhat mixed. Nethighstreet is the only manufacturer in the group to include a joystick – the Saitek ST290 – but it has failed to capitalise on its potential by not including a suitable game.

The two action titles (Thief: Deadly Shadows and Joint Operations) are best played

with a joystick. Some amends are made with the bundled Epson Stylus CX3600, as this provides decent scanning, printing and copying functionality and has relatively low running costs.

It doesn't have picture-perfect image reproduction, but is good enough to print your holiday snaps on provided you aren't in a great hurry.

The NetPCW 999 is good PC on the whole. It has some thoughtful additions that will appeal to many users, but it fails to fully exploit its slight leaning towards gamers.

As a result, it gives the edge to its rivals, most of which have a more competitive peripherals bundle or superior performance.

DETAILS

RRP £999 (£850.21 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Nethighstreet

08700 271 339

www.nethighstreet.com

PROS Multifunction device

CONS Joystick isn't really of much value

VERDICT

A solid all-round PC, but outclassed in this group

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★



Tiny.com Arvus

Tiny.com's bizarrely named entry, the Arvus, is a PC that bears similarities with many of its rivals, but stands out as one of only two systems in the group with an Athlon 64 3500+ CPU. This was paired with 1GB of DDR400 memory – a combination that helped steer the Arvus towards the top end of our performance charts.

Its impressive specification is aided by a capacious 250GB Maxtor hard drive. Along with the Mesh Matrix Prestige Connect, this PC was the only submission that offered more than 160GB of primary storage – a fact that should be noted by digital photography enthusiasts and video hoarders.

Like the Jal Tacita, the Arvus has a TV tuner card but this is compatible with analogue broadcasts only. The experience isn't as user-friendly as PCs that are equipped with Windows XP Media Center Edition, but it is an attractive inclusion that should be useful to many users.

We were also pleased to see a 19in TFT monitor with the Arvus – one of only three in the group. It doesn't offer a higher resolution than the 17in panels, but the extra 2in of space makes watching movies from a distance slightly more comfortable.

With such a solid specification, we weren't surprised that some

compromises were made in the accompanying peripherals bundle. The Lexmark P6250 is a welcome addition to the package, serving as a printer, scanner and colour copier, but the Opus 4000 digital camera is a bit of a let-down. It has a 4megapixel lens but is better suited as a first digital camera for a child than for serious photo enthusiasts.

Tiny.com has suffered a checkered reputation for customer service, but has put measures in place to improve on this. With the Arvus, Tiny.com has put together an impressive bundle. If you've no need for a new digital camera, it is one of the better PCs in this group and deserves a PCW Highly Commended award.

DETAILS

RRP £999 (£850.21 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Tiny 08708 303 156

www.tiny.com

(Quote e-code: E10268)

PROS Hard disk; TV tuner; performance

CONS Bundled camera

VERDICT

Impressive PC but bundle is let down slightly by camera

FEATURES

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



Watford Aries Performa 5552

Last but not least is Watford's Aries Performa 5552. Like the Tiny.com Arvus, it is based on an MSI RS480M2-IL motherboard, which uses the relatively uncommon ATI IGP 9100 chipset. One of the major selling points of this motherboard is that it uses a fairly potent integrated Radeon X300 graphics chip, but Watford has chosen to bypass this in favour of an ATI Radeon X800-based card.

On its own, this is the most potent graphics solution in the group, but paired with a relatively slow CPU and just 512GB of memory, it struggles to keep up with its rivals. It achieved similar performance to some of its rivals in our Internet Productivity tests, but its overall Sysmark 2004 tally was affected by a lacklustre Office Productivity score.

Fortunately, the Performa 5552 atones for this deficit with a strong peripherals bundle. Watford has included a Canon Pixma MP130 and a Canon Powershot A400 digital camera. This is a very good pairing for any users wanting to take their first steps in digital imaging, as the 3.2megapixel A400 captures very good stills and the Pixma MP130 reproduces them competently. Usefully, it also acts as a scanner and colour copier and can print directly from a memory card. Our only

real gripe with the MP130 is the fact that it can be rather slow.

The rest of the PC is well specified. Watford has included a dual-layer DVD rewriter, a 160GB hard drive and a 19in Neovo TFT display. The image quality this produces isn't on a par with some of the Viewsonic submissions seen elsewhere, but it offers a larger display area, which may prove useful when editing pictures or watching movies.

The Watford Aries Performa 5552 has a lot going for it. Its performance was a bit of a let-down in our tests, but most home users wouldn't notice the drop in speed. If you want a solid all-round machine with a worthwhile accessories pack, it is arguably the best in the group.

DETAILS

RRP £999 (£850.21 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Watford

0870 027 0900

www.savastore.com

PROS Printer and camera bundle; graphics card

CONS Performance

VERDICT

Slower than its rivals, but has a strong accessories bundle

FEATURES

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★





Table of features

				
MANUFACTURER	EVESHAM	JAL	MESH	
MODEL NAME	NFORCE GT	TACITA	MATRIX PRESTIGE CONNECT	
Price inc VAT (ex VAT)	£999 (£850.21)	£999 (£850.21)	£999 (£850.21)	
Sales telephone	0870 160 9500	08707 525 810	0870 046 4747	
URL	www.evesham.com	www.jal.co.uk	www.meshcomputers.com	
HARDWARE SPECS				
Processor	AMD Athlon 64 3200+	AMD Athlon 64 3200+	AMD Athlon64 3800+	
Motherboard	MSI K8N Neo-4	Optronix OP-K9A200G-MLF	Asus A8V Deluxe	
Chipset	Nvidia Nforce 4 Ultra	ATI Radeon Xpress 200	Via K8T800 Pro	
Available memory/type	512MB PC3200 DDR Ram (400MHz)	1GB DDR 400 (400MHz)	1GB PC3200 DDR Ram (400MHz)	
Occupied/spare memory (Ram) slots	2/2	2/2	2/1	
Max memory in this configuration	2.5GB	3GB	1.5GB	
Max memory supported by motherboard	4GB	4GB	3GB	
Hard disk manufacturer and model	Western Digital WDC WD1600-JD 00HBB0	Maxtor 6B160M0	Maxtor 6 Y250M0 Sata, 150MB/sec	
Hard disk size	160GB	160GB	250GB	
EXPANSION AND I/O				
No of 3.5/5.25in bays/free 3.5/free 5.25in bays	4/4/2/2	7/4/5/2	4/3/2/1	
No of PCI/shared/AMR slots	4/0/0	5/0/0	5/0/0	
No of free PCI/shared/AMR slots	3/0/0	4/0/0	3/0/0	
No of USB2/Firewire/Serial/parallel/PS/2	6/2/1/1/2	7/1/1/1/2	8/2/1/1/2	
MULTIMEDIA				
Primary optical drive	Sony DW-D23A	BTC DRW10161B	Sony DW-D22A DVD-RW	
Optical drive formats and speed (max)	DVD-R: 8x, DVD+R: 16x, DVD+R DL: 2.4x	DVD+/-R: 16x, DVD+RW: 8x, DVD-RW: 4x	16x/8x/16x/2.4x/4x/4x (DVD-Rom/-R/+R/+R DL/-RW/+RW)	
Secondary optical drive	Sony DDU-1613	OEM CD-Rom	Sony DDU1613 DVD-Rom	
Optical drive formats and speed (max)	DVD-Rom: 16x	DVD-Rom: 16x	DVD-Rom: 16x	
Soundcard	Via AC'97 Enhanced Audio Controller - 5.1 Surround Sound 6 Channel Audio	Realtek AC'97	VIA AC'97 Enhanced Audio Controller - 5.1 Surround Sound 6 Channel Audio	
Speakers	Creative Inspire P5800	Altec Lansing VS.2121	Creative Labs Inspire T7900 - 7.1	
Graphics chip/memory	Nvidia Geforce 6600GT / 128MB	Nvidia Geforce 6600GT	Nvidia Geforce 6600GT/128MB	
Screen type, size and (maximum resolution)	Viewsonic VX715, 17in, 1,280 x 1,024	Viewsonic VX912, 19in, 1,280 x 1,024	Viewsonic VE710b, 17in, 1,280 x 1,024	
PERIPHERALS				
1	Epson Stylus CX3600	Epson Stylus Photo R200	Belkin Hi-Speed USB2 7-port hub	
2	X-Micro EVA mp3 player 256MB with FM radio	Avermedia AverTV DVB-T USB Freeview box	Logitech Premium Stereo USB headset 30 and Skypeout 120 free mins	
OTHER INFORMATION				
Modem/other hardware	V.90 modem	V.90 modem, 7-in-1 card reader	V.90 modem/integral external USB2 8-in-1 reader	
Network/operating system	Wired Gigabit Lan/Windows XP Home	10/100MB Lan/Windows XP Home	Wired Gigabit Lan/Windows XP	
Bundled software	E-trust Anti Virus	Works Suite 2004	MS Works 8, Pinnacle Studio 9 SE, Instant CD/DVD and Intervideo WinDVD, 60-day MS Office trial	
Standard warranty (RTB = return to base, C&R = collect and return)	2 years onsite, 3rd year RTB	2 years onsite, lifetime labour RTB	3-year onsite hardware (mainland UK only)	
SCORES				
Features	★★★★★	★★★★★	★★★★★	
Performance	★★★★★	★★★★★	★★★★★	
Value for money	★★★★★	★★★★★	★★★★★	
Overall score	★★★★★	★★★★★	★★★★★	

Vendors of group test products are only obliged to sell them at the prices quoted here (which include delivery and credit card surcharges) for the life of this PCW issue. They may also change components under certain circumstances.

For the best PC bundle prices go to www.pcw.co.uk/bestprices

		
NETHIGHSTREET	TINY.COM	WATFORD
NETPCW 999	ARVUS	ARIES PERFORMA 5552
£999 (£850.21)	£999 (£850.21)	£999 (£850.21)
08700 271 339	08708 303 156 (Quote e-code E10268)	0870 027 0900
www.nethighstreet.com	www.tiny.com (Quote e-code E10268)	www.savastore.com
AMD Athlon 64 3500+	AMD Athlon 64 3500+	AMD Athlon 64 3200+
MSI K8N-Neo 4	ATI RS480M2-IL	ATI RS480M2-IL
Nvidia Nforce 4 Ultra	ATI Radeon Xpress 200	ATI Radeon Xpress 200
512MB DDR 400 (400MHz)	1GB DDR 400 (400MHz)	512MB DDR 400 (400MHz)
1/3	2/2	2/2
3.5GB	2.5GB	2.5GB
4GB	4GB	4GB
Maxtor 6Y160M0	Maxtor 6Y250M0	Maxtor 6Y160M0
160GB	250GB	160GB
4/4/3/2	4/3/2/1	4/2/2/1
4/0/0/0	3/0/0/0	3/0/0/0
3/0/0/0	0/0/0/0	2/0/0/0
6/1/1/1/2	6/1/0/1/2	6/2/0/1/2
NEC 3920A	Sony DW-D23A	Sony DW-D22A
DVD-R: 16x, DVD-RW: 6x, DVD-R DL: 4x, DVD+R: 16x, DVD+R9: 4x, DVD+RW: 8x, CD-R: 48x, CD-RW: 24	DVD-R: 8x, DVD+R: 16x, DVD+R DL: 2.4x	DVD+R: 16x, DVD+RW: 4x, DVD-RW: 4x, DVD-R: 8x, DVD+RW DL: 2.4x
HL-DT-ST GDR-8163B	N/A	N/A
DVD-Rom: 16x	N/A	N/A
Realtek AC'97	Realtek AC'97	Realtek AC'97
Creative Inspire P5800	Neutec 5.1 speakers	Creative Inspire P5800
Nvidia Geforce 6600GT	ATI Radeon X600	ATI Radeon X800
Viewsonic VE702M, 17in, 1,280 x 1,024	Benq, 19in, 1,280 x 1,024	Neoview AL190N, 19in, 1,280 x 1,024
Epson Stylus CX 3600	Lexmark P6250	Canon Pixma MP130
Saitek ST290 joystick	Opus 4000 digital camera	Canon Powershot A400
V.90 modem	V.90 modem, TV tuner, Wifi	V.90 modem
Gigabit Lan/Windows XP Home	10/100MB Lan, 802.11b/g Wifi/XP Home	10/100MB Lan/Windows XP Home
Thief: Deadly Shadows, Joint Operations, PowerDVD 5, Nero	Works V7 (60-day office trial) Power Producer V3.01, Power DVD V5, Power2go 2.05, Musicmatch Jukebox 8.10	Roxio EZCD Creator Suite 7, Panda Antivirus Titanium 2004, MS Works Suite 2005
1 year RTB parts and labour, 2 years RTB labour only	3 years RTB	1-year onsite parts and labour, 5 years RTB labour only
★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★

Accessories

Avermedia AverTV DVB-T USB Freeview Box

This piece of kit lets you watch over 30 digital Freeview channels on your PC. Its user interface can be tricky to get used to, but we'd recommend it to any TV buff.

£84.99

www.averm.co.uk

★★★★★



Belkin Hi-Speed USB 2 7-Port Hub

Not a very exciting peripheral, but it is handy for users who intend to connect a large number of USB devices to their PC.

£26.99

www.belkin.co.uk

★★★★★

Canon Pixma MP130

We didn't expect much from a sub-£100 all-in-one, but the MP130 surprised us with its high-quality photo and text prints and the ability to print directly from a memory card. It won't blow you away with its print speed, but it is a solid all-rounder.

£97.70

www.canon.co.uk

★★★★★



Lexmark P6250

A versatile all-in-one printer, scanner and copier that produces good-quality photos and text. It is surprisingly quick for an all-in-one, producing 8 x 10in photos in less than six minutes.

£128.31

www.lexmark.co.uk

★★★★★

Opus 4000 digital camera

It doesn't take an expert to realise this camera isn't very good. It could prove a good way of getting children interested in photography, but serious snappers should opt for the Canon Powershot A400.

www.tiny.com

£99

★★★★★

Canon Powershot A400

This entry-level camera captures images on a par with cameras that cost a lot more. It doesn't allow much customisation over the picture-taking process, but aside from this, it is an excellent camera for most occasions.

£107

www.canon.co.uk

★★★★★



Accessories

Epson Stylus CX3600

A good all-in-one printer, scanner and copier that is fairly cheap to run, but can be painfully slow. A full-colour photo will take 10 minutes and best-quality text print speeds can be as low as 2ppm. See a full review at www.pcw.co.uk/products/hardware/1161754. £70.81

www.epson.co.uk

★★★★★



multi-channel speakers. The integrated noise-canceling microphone comes in handy for making VoIP calls, but its appeal may be limited to a small number of users.

£49.99

www.logitech.co.uk

★★★★★

Epson Stylus Photo R200

Lacks the copying and scanning features of some of its rivals in this group, but the R200 delivers decent photo results and lets you print directly to CD.

£70

www.epson.co.uk

★★★★★



X-Micro EVA MP3 Player 256MB with FM radio

The EVA is much like any flash-based portable audio player, but it features an FM radio. It has a rather cheap feel to it, though and it can't store as many songs as some modern players.

£44.99

www.evesham.com

★★★★★

Logitech Premium Stereo USB Headset 30

This high-quality headset is ideal if you don't want to wake the neighbours with

Saitek ST290

The ST290 is a well-constructed ambidextrous joystick with five thumb buttons, a rapid-fire trigger, and a point-of-view switch. It doesn't add much value to a PC bundle, as it can be bought for under

£30.£24.99

www.saitek.com

★★★★★



Editor's Choice

Each vendor that supplied a PC for this group test interpreted our brief in different ways. Some, like Mesh, clearly opted to place little emphasis on the peripherals that accompany their PC, while others have splashed out more on the accessories.

Both Evesham and Mesh submitted good PCs. The peripherals that accompany the Mesh Matrix Prestige Connect (a USB hub and a VoIP headset) may not be of very high value but Mesh compensates by providing fast internal components. Under normal circumstances this PC would have been a strong contender for an award, but with the focus on this group test being the combination of PC and peripherals, it comes up short.

The winners

Our first **Highly Commended** award goes to the **Tiny.com Arvus**. This PC surprised us with a fairly generous core specification and a good bundle of accessories. It lets itself down quite badly in comparison to the rest of the group thanks to a rather modest graphics card, but if you're not into serious 3D gaming, it is one of the most attractive deals in the group. The Arvus incorporates a TV tuner alongside a large 250GB hard drive and is the only PC in this group that includes a Lan 802.11b/g Wifi card for wireless networking. It is let down slightly by the rather poor bundled digital camera, but if you're not serious about photography then the accompanying Lexmark P6250 all-in-one printer makes amends.

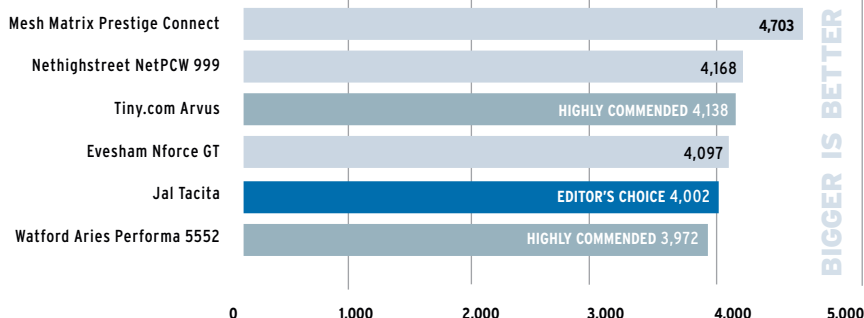
The second **Highly Commended** award winner is **Watford's Aries Performa 5552**. It wasn't particularly impressive in our benchmark tests, but it had a solid core specification that was complemented by some very thoughtful accessories. Digital photography enthusiasts will be especially thrilled at the inclusion of a Canon printer and scanner combination and the 19in Neovo monitor, although a budget item, rounds off the package nicely.

The winner of the **Editor's Choice** award is the **Jal Tacita**. Its Athlon 64 3200+ CPU doesn't provide the same computing power as the Mesh submission and its hard drive is a little small compared to the Tiny.com Arvus, but it does just as well, if not better, in other areas. Its peripherals bundle was somewhat unusual (a digital TV card and an all-in-one printer), but we found this combination offered arguably the greatest value of any in the group. The Tacita also comes with the best monitor in the group – a 19in Viewsonic VX912 panel which offers a fast 12ms response time and large viewing area.

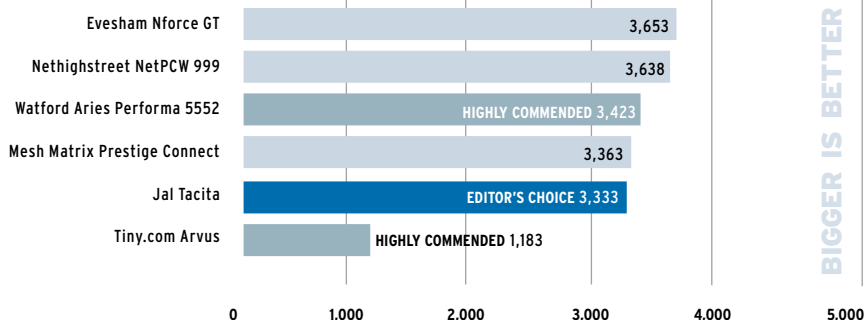
Of course, whether any of our winners are right for you depends entirely on your requirements, but we believe our list of entries has something for everyone, whatever you're looking for.

Lab results

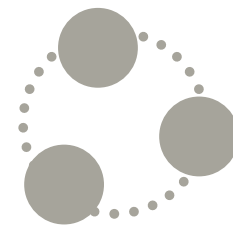
PCmark 2004



3Dmark05 (1,024 x 768 at 32bit)



Please see page 12 for an explanation of how we tested the PCs



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Double power for small networks

Mains plugs could be things of the past for many devices

Homes and offices will be able to power a wider range of products directly from their networks thanks to a new product from power-over-ethernet (PoE) specialist Powerdsine. The 8001 Midspan will allow devices such as point-and-tilt surveillance cameras, which require more power than normal webcams, to be driven by a single Cat5 cable.

The current PoE standard, IEEE 802.3af, delivers just 15.4w, which means any product that requires more power to work must have a separate power cable plugged into the mains. An emerging standard called PoE Plus (often referred to as High PoE) should be ratified early next year and can supply products with up to 39w.

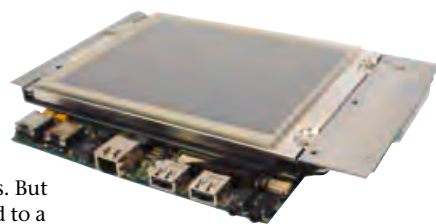
This is getting close to the power required by a notebook (see this month's News section) and is enough to run low-drain specialist PCs used for purposes

such as data collection and point-of-sale terminals.

One flat-panel PC (see picture) from UK-based DSP draws only 12.9w and has been certified for the older 802.3af-powered links. But even DSP is looking forward to a higher powered standard. 'It will allow us to use bigger screens,' said sales director Don Findlay.

PoE specialist Powerdsine, which is helping draw up the PoE Plus standard, already offers products that anticipate the specification. These are six- and 12-port Midspan devices that convert non-PoE switches or hubs to PoE Plus delivering up to 39w per port.

But the 8001 is aimed at smaller networks or one-off tasks. It adapts any single unpowered Ethernet jack to PoE Plus and requires a splitter box at the far end of the cable to separate the data from the power.



PoET (Power over Ethernet terminal) 6000 PC from DSP Design, running XP embedded on a Via Geode system-on-a-chip, draws only 12.9w

It provides a standard 802.3af feed to any normal PoE device; other devices connect to the network jack as usual for data and draw power from a socket on the splitter. This is delivered at 12v, though the voltage across the cable is around 48v to reduce current. The splitter and Midspan will be available shortly for around £50 each.

www.dspdesign.com
www.powerdsine.com

Clive Akass

Microsoft folds Maps

The Microsoft Authorised Premier Support (Maps) program for service providers is being discontinued and enterprise customers and partners will be supported directly. Alistair Baker, Microsoft UK general manager, said customers preferred dealing directly with Microsoft. 'We saw a lower customer satisfaction rating with the Maps scheme.'

Carrier Ethernet test

The Metro Ethernet Forum is to begin testing next-generation network traffic protocols. Carrier Ethernet will deliver tens of Gbytes/sec transfer speeds as well as broadcast-quality video on demand. 'I see Ethernet developing in four directions,' said Bob Metcalfe, the 'father' of Ethernet. 'Up in speed... down to the eight billion processors that are not yet networked... increasingly over wireless links... and across the 'telechasm' between local area and wide area networks.'

SMEs struggling

Almost 60 per cent of the UK's small and medium-sized businesses are unprepared and under-resourced to handle security and virus threats, with basic IT problems extending IT managers' average week by up to half a day. Security is the top IT concern, according to the IT Issues Survey conducted by PC World Business.

www.pcw.co.uk/news/1162510

Red Hat added to diskless boot tool

A new version of Qualystem's Lan-PC software enables diskless workstations to boot from a server instead of a local copy of Windows.

The update improves performance and adds support for Red Hat Enterprise Linux ES as a host system.

Lan-PC 3 version 6 lets a network of Windows client systems boot from centrally managed Windows images, allowing tighter control over the user environment and eliminating the need to install Windows on each system.

Qualystem already supported a range of host platforms, including Windows, Unix and Linux. The company said it was

responding to customer requests to port Lan-PC to Red Hat's Enterprise Linux ES server distribution. It has boosted performance of Lan-PC 3 through improvements such as multi-threaded disk operations. It also works with another

Qualystem tool, Activecloner, to speed up restore operations.

Under Lan-PC 3, each computer boots the operating system from a server hard disk using the Preboot Execution Environment (PXE) standard.

Individual users can customise their desktop environment and save their configuration, or the system can be set up so they must boot up each time with the initial configuration. The latter mode is useful for controlling kiosks or classroom scenarios, according to Qualystem.

Lan-PC 3 version 6 supports Windows 2000, XP or XP Embedded (XPE) clients and costs from £70 per seat.

Daniel Robinson



Control your user environment



networks@pcw.co.uk

Check the rates or pay heavily for broadband

If the price you're paying hasn't reduced since you signed up, you're probably forking out too much, says Alan Stevens

'It's well worth checking what you're paying and comparing it to what new customers are charged'

Have you checked recently to see how much you are paying for broadband? No? Then if you've read our broadband feature on page 91, you will know that you are in for a shock.

New high-speed broadband services are generally available for less than you are probably paying now. And if you have been with your provider for a while, you could be stuck on an old tariff, paying hundreds of pounds a year more than you need to for the service you're getting.

That's exactly what happened to an early adopter of ADSL, a small company that thought it could rely on provider Demon Internet to keep it informed of developments and price changes. That was until a senior member of staff decided the company needed more bandwidth and looked at what offers were available from Demon.

It wasn't much of a surprise to find that the Internet service provider had introduced a number of new services offering more bandwidth for less than the company was paying for its 512Kbits/sec managed connection. However, the fact that Demon had lowered the price of that service several months earlier certainly was a shock. To make matters worse, the ISP had not dropped the price by a small amount but had cut monthly charges by almost a third.

When contacted, Demon magnanimously agreed to drop the rate from then on, but steadfastly refused to backdate the change or issue a refund. Furthermore, according to the email from Demon customer services, the lower prices were 'introduced to new customers only' adding

'it is the customers' responsibility to make themselves aware of any price changes'.

To check that this wasn't a one-off mistake or misunderstanding I contacted the press office at Demon parent company Thus to find out just what the company policy was.

This is what Deborah Rodger, head of press and corporate communications, had to say: 'When customers reach the end of their minimum 12-month contract period they are free to contact us and look at what other products and/or tariffs they might wish to change to, or indeed whether they wish to cancel their service.'

And as for the email from Demon customer services, she confirmed, 'Without contact or instructions from customers we will continue to provide an ongoing high-quality service and to charge the customer on a rolling basis the amount they signed up to at the point of ordering and on the same terms and conditions.'

I suspect that's not what most customers would expect of a well-established service provider with numerous awards to its name. It does nothing to encourage customer loyalty – and as you will have seen, there are now plenty of alternative offerings available at highly competitive rates.

The only reason the customer I mention didn't switch ISPs was the upheaval involved.

So if you've been signed up to a broadband or any other telecoms service for a while, it's well worth checking what you're paying and comparing that to what new customers are charged. The difference may be substantial and one short phone call might very well save you a lot of money.

Onweb tool mobilises legacy applications

Netmanage has updated its Onweb product family for web-enabling enterprise applications, so companies can extend access to staff using mobile and wireless devices.

Onweb Mobile connects to back-end systems including mainframes, Unix and IBM I Series servers and republishes applications and data in a format

suitable for handheld clients without needing modifications to the original applications.

Many companies still run legacy back-end applications, which need to be accessible via PDAs and other mobile devices that often have small screens

PDA users will get access to back-end apps



and limited processing power. Netmanage's product allows the host screen to be represented on a browser and it can be modified to make it easier to use.

To help the process, Onweb Mobile comes with a point-and-click development environment that includes wizard-driven help to build the client-side application logic and repackage applications into web services that can be downloaded to the mobile client if necessary. However, the amount of

development work needed is minimal, the company said.

Eyal Orgil, Netmanage's European marketing manager, said the final look of the application will depend on the original and on the information presented. 'You might end up with a small standalone executable on the PDA that queries data from the back-end system. It's the application that largely defines how you need to interact with the Onweb server.'

Daniel Robinson

DATA SECURITY

PKware Securezip Server 8.1

Standardise security on a corporate network

```

C:\Acct\Month End>pkzipc -add -password Backup0401.zip *.xls
SecureZIP(tm) Server Version 8 for Windows
Copyright (C) 1989-2005 PKWARE, Inc. All Rights Reserved, Registered Version
PKZIP Reg. U.S. Pat. and Tm. Off. Patent No. 5,051,745
Patent Pending

* Strongly encrypting files with a password using AES (256-bit)
* Using default compression method

Creating .ZIP: Backup0401.zip

Password? *****
Re-enter password for verification
Password? *****

Adding File: Apr 2003.xls Deflating (86.8%), Encrypting done
Adding File: Apr 2004.xls Deflating (93.6%), Encrypting done
Adding File: Aug 2003.xls Deflating (86.8%), Encrypting done
Adding File: Aug 2004.xls Deflating (86.8%), Encrypting done
Adding File: Dec 2003.xls Deflating (81.3%), Encrypting done
Adding File: Dec 2004.xls Deflating (81.3%), Encrypting done
  
```

Left: Securezip Server 8.1 will prompt you for a password before encrypting or zipping the file set

Below: Certificate encryption with an email address as the recipient designator

```

C:\Acct\Month End>pkzipc -add -recipient="jim.peterson@pkware.com" Backup0401.zip *.xls
SecureZIP(tm) Server Version 8 for Windows
Copyright (C) 1989-2005 PKWARE, Inc. All Rights Reserved, Registered Version
PKZIP Reg. U.S. Pat. and Tm. Off. Patent No. 5,051,745
Patent Pending

* Strongly encrypting files with recipients using AES (256-bit)
* Using default compression method

Creating .ZIP: Backup0401.zip

Adding File: Apr 2003.xls Deflating (85.9%), Encrypting done
Adding File: Apr 2004.xls Deflating (93.6%), Encrypting done
Adding File: Aug 2003.xls Deflating (85.9%), Encrypting done
Adding File: Aug 2004.xls Deflating (85.9%), Encrypting done
Adding File: Dec 2003.xls Deflating (79.6%), Encrypting done
Adding File: Dec 2004.xls Deflating (79.6%), Encrypting done
Adding File: Feb 2004.xls Deflating (79.0%), Encrypting done
Adding File: Feb 2005.xls Deflating (67.0%), Encrypting done
Adding File: Jan 2004.xls Deflating (64.1%), Encrypting done
Adding File: Jan 2005.xls Deflating (93.6%), Encrypting done
Adding File: Jul 2003.xls Deflating (71.2%), Encrypting done
Adding File: Jul 2004.xls Deflating (71.2%), Encrypting done
  
```

PKware is best known for file compression utilities, but the company also develops software to help keep data safe. Securezip Server 8.1 offers enterprises the ability to transfer data within and outside their organisations while ensuring it is kept safe from unauthorised users.

Securezip Server 8.1 offers the same basic feature list as Securezip 8.1, but also includes the ability to protect files and folders using a command line interface. The package is available across Windows, Unix/Linux, making it ideal if you want to communicate with external partners that are on a different operating system.

Like the rest of the PKware range, this product's biggest draw is its use of the widely accepted zip compression format. Unlike some rival compression products, which can create archives of up to 4GB, Securezip Server 8.1 can handle archives of over a terabyte (TB) and supports 262,144 compressed files per zip archive – ideal for those performing large, complex backups.

In addition, the program offers automatic file splitting, which divides an archive into configurable segment sizes – great if you have an email system that doesn't cope well with large attachments. It can be configured to automatically encrypt particular file types and can be integrated with Microsoft Outlook and Lotus Notes email clients. The software also allows ftp transfer integration, but we were disappointed at the lack of a dedicated ftp client.

The program uses industry-standard encryption techniques including Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES). It also supports digital certificates. These can be daunting to work with, but the software can retrieve certificates stored on a directory server, making it easy to send certificate-encrypted files to anyone in a trusted community of users.

Sending secure files to users outside the trusted community can be done using a secure password to unlock protected files. These can be viewed using

a free zip reader, which can be downloaded from the PKware website. Unfortunately the program doesn't provide much guidance on choosing a strong password, so all the fancy security algorithms used by Securezip Server 8.1 may be bypassed by a determined hacker using brute force trial and error attacks.

One of the program's major benefits is the flexibility it allows administrators. Corporate policies, such as choosing which file types are automatically encrypted and compressed when attached to an email, can be enforced across a network or within an individual workgroup. Although Securezip Server 8.1 command line interface can be used to help automate compression and decompression via scripts, some users prefer the familiarity of a graphical user interface.

All these features don't come cheap. Securezip Server 8.1 costs £1,200 for a 1-2 CPU licence and £1,440 if you want the Directory Integration Module for looking

up digital certificates. It is undoubtedly a lot of money to spend, but it is an efficient way of adding security and ensuring the adoption of consistent company-wide practices when storing or transferring data on and off your server.

Rory Reid

DETAILS

PRICE £1,200 (£1,021 ex VAT)

CONTACT PKware

www.pkware.co.uk

SPECIFICATIONS

Windows Server 2000 and 2003 • Solaris 2.8 or later • HP-UX 10.20 or later • IBM-AIX 4.3.3 or later • Linux 2.4 or later kernel (including RedHat and Suse)

PROS Large archive support; automatic encryption
CONS Pricey

VERDICT

PKware Securezip Server 8.1 is a powerful product and a good way to standardise security on your corporate network

FEATURES ★★★★★
ENTERPRISE VALUE ★★★★★
EASE OF USE ★★★★★
OVERALL ★★★★★

NETWORK STORAGE

Buffalo Terastation

A great option if you want to add storage



Aimed at business users but equally useful on a home network, Buffalo's Terastation is a stylish Network Attached Storage (Nas) device with a terabyte of space.

Four internal 250GB hard drives provide the storage, which can be configured into two arrays based on Raid levels 1 or 5 for either speed or redundancy. By default the drives are spanned creating a single terabyte volume, but although you set up multiple shared folders on the same array, you can't specify their size.

The unit is managed through a web-based interface, which is password protected for added security. The Terastation can be configured quickly and will fit into both a Windows domain, although with some limitations, or a normal workgroup. Users and group level permissions for network shares can also be set. Status LEDs on the front panel of the unit lets you monitor drive activity.

Connection to the network is via a single Gigabit Ethernet port, which should provide sufficient bandwidth. Meanwhile, four USB2 ports allow you to plug in additional external hard drives for more storage or backup and a single printer – the Terastation includes built-in print server. The

Terastation can also be used in conjunction with Buffalo's Linkstation for wireless media streaming and supports TV recording USB tuners.

Buffalo includes a backup utility and, should a drive fail, disks are accessible and can be swapped out. UPS compatibility allows both automatic and manual shutdown.

The Terastation would fit into any small office network but it's also well suited for a home entertainment network.

Alex Arias

DETAILS

PRICE £652.12 (£555 ex VAT)
CONTACT Buffalo 01753 555 000
www.buffalo-technology.com

SPECIFICATIONS

1 x Ethernet port (1000Base-T/100Base-TX / 10Base-T) • Supports Appletalk, FTP protocols, • Raid 1 and 5, Jbod, spanning • Ultra ATA / 133 drive interfaces • Four USB2 ports • 168 x 221 x 241mm (w x d x h)

PROS Scalability; easy to use

CONS Cannot set share sizes within arrays; support limited to Windows

VERDICT

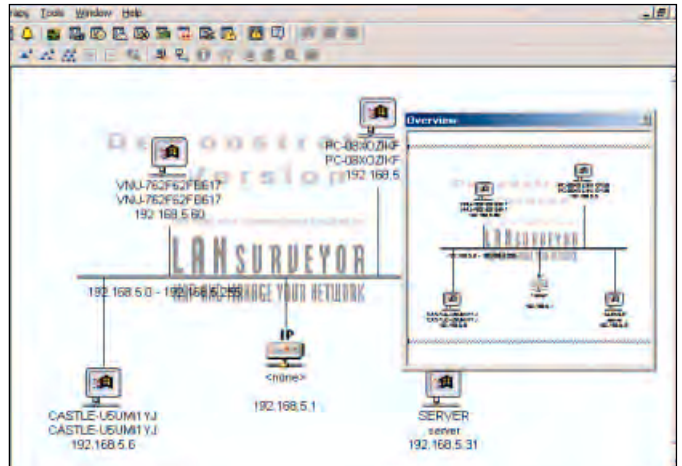
An excellent solution for home or small business network users looking to add more storage

FEATURES ★★★★★
PERFORMANCE ★★★★★
ENTERPRISE VALUE ★★★★★
OVERALL ★★★★★

LAN MANAGEMENT

Neon Lan Surveyor 9

Map complex networks with ease



Lan Surveyor provides a good clean overview of the network and is quick and easy to install

Lan Surveyor 9 is the latest edition of Neon Software's easy to use network management system. It combines automated network mapping, asset management and network monitoring with remote administration and distribution.

The management console is quick to install and an initial map of your network can be established in minutes. Lan Surveyor understands SIP clients as well as standard network protocols and v9 allows maps to be filtered into three levels, making it easier to understand complex networks. There's also the option to generate inventory list reports, which can then be exported to Excel.

Additional details can be acquired using the Neon Responders, Lan Surveyor's client software tools for asset management and reporting. These need to be installed on each PC you want to manage and can be distributed manually or via Active Directory. Data can also be gathered from some third party applications. The client software can be used to manage individual or groups of nodes and also to launch applications on remote clients.

Network monitoring provides useful tools to help maintain the integrity of the network. In

particular, v9 provides TCP Port Monitoring for checking the availability of applications and services and you can also keep track of devices. There's also an intrusion detection system (IDS) that scans the appropriate network ranges and looks for rogue nodes on the network. This now gives you the option of authenticating network nodes with a variety of third party solutions, including Microsoft's Baseline Security Analyzer. Lan Surveyor 9 is easy to follow and lets administrators gain control of complex network layouts.

Alex Arias

DETAILS

PRICE From £323.12 (£275 ex VAT)
CONTACT Neon Software
 01798 873 001
www.neon-software.co.uk

SPECIFICATIONS Management console - 256MB of Ram • Windows 2000 or above • Visio 2002 or above for Visio exports; Neon Responders - Windows 95 above • Mac OSX 10.1.5 or later, Mac OS8 or 9

PROS Ease of use; monitoring tools
CONS Bland interface

VERDICT

Inexpensive tool to map complex networks

FEATURES ★★★★★
ENTERPRISE VALUE ★★★★★
EASE OF USE ★★★★★
OVERALL ★★★★★



WORDS: ALAN STEVENS

More choice for your voice

Setting up IP calling doesn't have to be expensive or complicated – we've examined five VoIP gateways to help you decide which product suits you

You don't have to buy into expensive, state-of-the-art IP telephony solutions to enjoy the cost, management and application benefits of Voice over IP (VoIP) technology. In fact, all you need to extend the reach of an existing analogue telephone system into the world of IP calling is a low-cost VoIP gateway, which routes calls to and from remote offices and home workers via the Internet.

VoIP gateways are now widely available, although their price, capacity and exact functionality varies according to the specification and manufacturer. But the basics are pretty much the same no matter what, with the VoIP gateway typically attaching to a company's private branch exchange (PBX) in place of one or more local extensions.

Calls made to those extensions are converted into VoIP data streams and forwarded over the Lan and/or Internet to an associated IP address. There, the receiving device can be an individual IP phone, a PC with a sound card and headset or another gateway device with one or more ordinary telephone handsets attached.

This arrangement is often referred to as long-line extension, with the remote phone behaving like a local extension despite being remotely connected using VoIP. As such, the remote phone will ring whenever a call is received or transferred to the corresponding extension on the switchboard. Likewise, outgoing calls can be made using the phone as normal and all the usual PBX features such as call forwarding, music on hold, voicemail and so on made available.





Audio quality is on a par with that of a traditional telephone system, with cost saving being the main advantage. Branch offices, for example, do not need their own PBX or key telephone system (KTS) hardware, or dedicated tie lines to connect these to the main switchboard. All that is required is a broadband or ISDN Internet connection or, if linking nearby offices, some kind of wireless link. The same applies to teleworkers, who can make and receive calls into the company PBX using ADSL or cable broadband, or even a mobile wireless connection, for free. With prices starting at under £100 ex VAT, VoIP gateways are hardly expensive and there are lots of products to choose from, five of which are examined in this article.

Multi-Tech Multi VoIP MVP210

The Multi VoIP family of VoIP gateways from Multi-Tech Systems includes both analogue and digital products with support for up to 60 lines. The Multi-Tech gateways are also sold by Avaya to provide branch office support to business users looking to deploy large-scale VoIP systems.

The MVP210 reviewed here is a small business solution with support for two analogue lines, although there are four physical connectors on the back panel. Two are programmable foreign exchange office/foreign exchange subscriber (FXO/FXS) ports with matching four-wire ear and mouth (E&M) connectors alongside.

The FXS interfaces are used to connect ordinary phones and KTS handsets, while most modern PBX

systems will plug directly into the FXO ports. The E&M ports are for older switchboards, while some Multi VoIP models support direct BRI/PRI ISDN connectivity. A 10/100Mbit/sec Ethernet port connects the gateway to the Lan with a serial port alongside for local management.

Windows management software is included for this purpose with browser-based setup another option, both supporting a similar GUI. There is also SNMP support with an associated utility called Multi VoIP Manager for centralised monitoring and management.

Multi Voip from Multi-Tech is well made and functional

The management interface is easy enough to master, but some familiarity with telephone systems is required to configure the phonebooks that drive the gateway's operation. Effectively filters to process the numbers presented to the gateway, these phonebooks offer rules that both add or strip off dialling prefixes (such as 9 for an outside line, for example) and direct VoIP calls to a remote

IP address. We had few problems setting up long-line PBX extensions, the only real difficulty being the need to work out exactly what was needed.

Support for both H.323 and SIP signalling protocols means the Multi-Tech gateway can be used with gateways from other vendors as well as IP handsets and analogue phone adapters. When used solely with other Multi-Tech products, however, there is also support for the firm's Single Port Protocol (SPP), which is easier to deploy behind a firewall and supports dynamic addressing.

Solwise VoIP-EL404

The VoIP-EL404 is the gateway that Solwise recommends for PBX long-line extension applications. It has just four FXO ports on the rear that can be used to connect to an existing switchboard or directly to one or more PSTN lines. To complement this, the firm also supplied us with a VoIP-EL404S (£221 ex VAT) sporting four FXS connectors for the attachment of analogue handsets.

This unit is typically deployed at the remote office or teleworker location, although gateways, adapters and IP phones from other vendors can be used if preferred. It is important to note that the Solwise gateway only supports the H.323 protocol by default, which is fine for most long-line extension applications.

However, replacement firmware must be downloaded and installed if the device is to connect to SIP adapters and phones and there is no facility to support the two protocols side by side, presenting administrators with an either/or choice.

Putting Solwise gateways at each site does simplify installation. All the cables needed for phone attachment and line connection are supplied and, as well as the four phone ports, there is a 10/100Mbit/sec Ethernet port and a serial interface for local setup and management.

Configuration is done either by attaching a terminal to the local serial port, using telnet to connect to the device remotely or by using a browser. The first two options force the user to navigate a command line interface (CLI) with a more graphical menu-driven interface for the browser. However, the browser interface, however, is basic and we found the CLI quicker and easier to use.

The Solwise gateway is built upon a dial plan that effectively acts as a set

of rules telling each device how to interpret the phone numbers presented to it. A simple default dial plan comes pre-configured, but must be modified to allow users to dial 9 for an outside line, or automatically forward calls to a PSTN line, for example.

Creating the rules is not particularly difficult, but it does take a little getting used to, so Solwise offers ready-made dial plans that can be downloaded, to cover basic requirements such as long-line extension with additional documentation. Help is also available directly from the vendor.



The Voip-EL404 offers simple deployment





Quintum Tenor ASM200

VoIP specialist Quintum Technologies offers a range of analogue and digital gateways under its Tenor brand, capable of handling from two to 120 simultaneous calls. All the gateways feature Quintum's own Multipath routing technology, which enables calls to be intelligently routed between an IP network, PBX and the public switched telephone network (PSTN).

The products also use the firm's Packetsaver technology, which minimises bandwidth consumption, as well as Nataccess, which allows for operation behind a network address translation (Nat) protected firewall.

We tested a Tenor ASM200 aimed at the small business, with two FXO ports for attachment to either PBX extensions or external PSTN lines and two FXS ports for analogue phone connection. A 10/100Mbit/sec Ethernet interface is used to connect the unit to the network with a serial port alongside, used mostly to assign an initial IP address to the unit via an attached terminal.

The serial interface can also be used for general management, although this is a lot easier with the Java-based Tenor Configuration Manager installed and run remotely on a Windows PC.

Support for both H.323 and SIP signalling means that devices from other vendors can be used to connect to the Tenor gateway. However, setup is a lot simpler if Tenor gateways are also installed at the remote end of the link due to the device's ability to map the ports on one gateway to those on the other to provide for long-line PBX extension.

This procedure is straightforward and, once complete, the user simply picks up a remote handset to get an immediate PBX dialling tone and access to all the normal switchboard facilities.

The Tenor gateways can also link PBX systems together with automatic least call-routing facilities, support remote breakout to the PSTN and keep the local system operational in the event of network or power failure.

The gateways are approved for use with Nortel Networks products. As a result, working out exactly what needs to be changed to support something as simple as long-line extension can take a while. Clearer documentation would help here, although the gateways are normally sold and installed by resellers, which should overcome this issue.

Audio quality was excellent and, although we had a few problems with firewall setup, the Quintum gateways were far from unique in this respect and otherwise worked extremely well.

Sipura SPA-3000

Sipura's SPA-3000 gateway differs from the others in this group test in that it is a very modest device. Selling at under £100 ex VAT it is equipped with just

The Quintum Tenor offers a good mid-range solution

one FXO and one FXS port, and is mostly sold as a simple analogue phone adapter for home use.

In this guise, the FXO port is connected to a dial-up line for failover and selective PSTN calls. The device also offers support for features such as call forwarding and conferencing, as well as a single long-line VoIP extension from a small business PBX.

The SPA-3000 itself is a tiny metal box with two telephone ports at one end and a single 10/100Mbit/sec Ethernet port at the other. Power comes from an equally small AC adapter and there is a neat interactive voice response (IVR) system to help with initial setup.

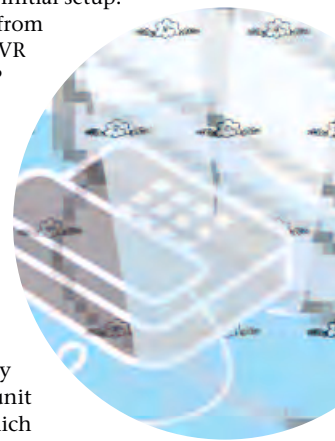
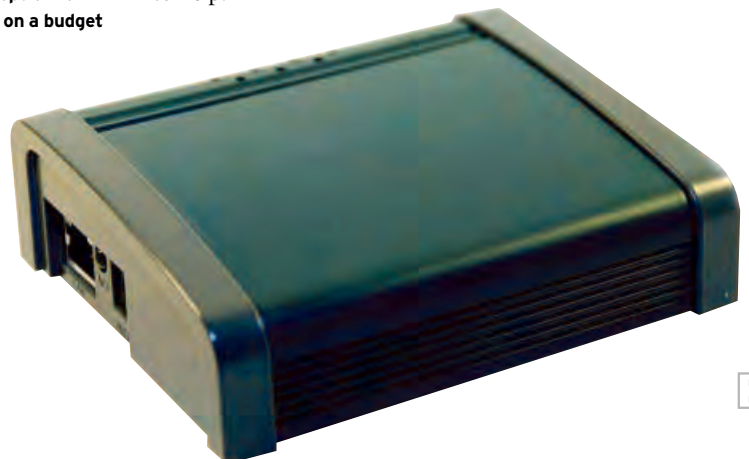
Accessed by dialling a special code from a phone attached to the FXS port, IVR allows DHCP to be selected or an IP address to be manually assigned to the unit. Other settings can also be programmed via IVR, although most of the remaining configuration work is done using the Sipura web interface.

Unfortunately, this interface is not particularly easy to follow with a bewildering array of parameters that can be modified should the need arise. Also, the only documentation supplied with the unit itself is a brief quick-start guide, which means downloading a more comprehensive manual from the Sipura website before proceeding.

On the positive side, many of the default settings can be left alone and there are a number of sample deployment scenarios in the manual to help guide you. Configuration can still be quite complex, though, especially with the dial plans that govern how incoming calls are interpreted and directed. It is also important to understand that the SPA-3000 only supports SIP, not H.323, which means that it has to register with a local SIP server or provider to work.

Eventually, we did get the SPA-3000 to work with our long-line extension scenario, but we would advise any firms looking to use this product to get a reseller to help.

The Sipura SPA-3000 is a good option for firms on a budget





Vegastream Vega 50

Once part of the Pace Micro group but now a separate company, Vegastream specialises in VoIP gateways for business and service provider use.

The organisation offers a range of products, starting with the Vega 50 reviewed here – which supports either 10 analogue or eight digital lines – and ending with the Vega 400, which can handle up to 120 connections.

The analogue Vega 50 can be configured with either 10 FXO ports for deployment at the central office or two FXO ports and eight FXS connectors for telephone attachment at a remote office location. A digital implementation (£1,114 ex VAT) has four BRI ISDN interfaces and, if required, the company can supply one- and two-port Sipura telephone adapters for use by teleworkers, starting at around £50 ex VAT.

Alternatively, support for both H.323 and SIP signalling means that end users are able to

The Vega 50 is a flexible product but it doesn't come cheap

connect using other software and hardware products that conform to these standards.

Cabling is fairly straightforward. The FXO connectors can be connected to either PBX extension lines or direct to the PSTN. This PSTN connectivity supports breakout to the public phone network and, on the FXS model, allows local calls to be made in the event of a power failure.

A single 10/100Mbit/sec Ethernet port then connects the unit to the local network with a choice of interfaces designed for management and monitoring including Telnet, SNMP and a more user-

friendly HTTP web front end. As with most of the gateways that we reviewed, a dial planner is used to configure a set of rules that govern what the gateway does with calls. Some familiarity with this approach is required, but it is not that difficult to master and simple PBX extension mapping proves very straightforward.

Help is also available from both Vegastream and its resellers; Vegastream helped us to configure both the Vega 50 and the Sipura adapter used for our tests.

The end result was a remote phone that behaved just like a local PBX extension with an immediate dial tone and access to all the usual PBX facilities over an Internet connection. The Vega 50 also supports quality of service (QoS) and silence suppression and offers a good range of codecs to provide good voice quality at all times.

Editor's Choice

Technically speaking, PBX long-line extension is one of the simplest VoIP applications there is to use, but that does not necessarily make it easy to deploy. All manner of problems can arise, from poor interfaces and baffling documentation to dynamic addressing issues and clashes with Nat-enabled firewalls.

Any small business or branch office considering such a solution should do plenty of research beforehand and choose a supplier with the resources and expertise to handle this kind of installation. Fixed IP addresses, both at the central office and remote locations, are a good idea, as is a router with a demilitarised zone (DMZ) to enable the gateway to connect to the Internet without any address translation to get in the way. Failing that, consider installing a VoIP-aware broadband router, such as the Intertex IX66 (www.intertextdata.com), especially at the remote office or teleworker end of the connection.

Leaving these issues aside, we did manage to get all the gateways tested here to do what we wanted, with the Solwise Voip-EL404 proving one of the simplest to deploy. Although this was partly down to its limited functionality, the product is still worth considering for basic long-line extension.

A similar argument applies to the Sipura SPA-3000, although only if just one line is needed. On top of this the Sipura's interface is one of the most complex we

came across, meaning that administrators will probably need to enlist help putting it to work as anything other than a SIP phone adapter.

It was a close choice between the Vegastream and the Multi Tech, both of which were very good, but we felt the **Vegastream Vega 50** just shaded it and so gets our **Highly Commended** award. With its 10 FXO Ports it is a good choice for the larger business looking to connect multiple offices and teleworkers to a central PBX. The fact that the vendor is UK-based is another bonus, added to which Vegastream can supply cheap Sipura adapters for use at the remote end of the link.

Vegastream also sells digital as well as analogue gateways, as does Multi-Tech, whose Multi Voip products are equally well made and very functional with plenty of configuration options beyond PBX long-line extension.

However, the product that most impressed us was **Quantum's Tenor AS** gateway, which wins our **Editor's Choice** award for this VoIP gateway group test.

The high specification enables the Tenor to be put to a wide range of uses, whilst the Quantum gateways gave excellent results in our PBX long-line quality and usability tests. They also proved by far the easiest to configure, meaning they are very good value for money all round.

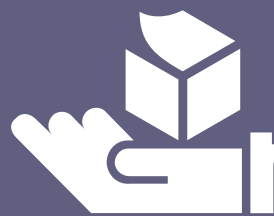




Table of features

MANUFACTURER	SIPURA	SOLWISE	MULTI-TECH	QUINTUM	VEGASTREAM
PRODUCT	SPA-3000	VOIP-EL404	MULTI VOIP MVP210	TENOR ASM200	VEGA 50
Price (ex VAT)	£98.70 (£84)	£259.67 (£221)	£669.75 (£570)	£399.50 (£340)	£1,308.95 (£1,114)
Manufacturer URL	www.sipura.com	www.solwise.co.uk	www.multitech.com	www.quintum.com	www.vegastream.com
Supplier	Provu Communications	Solwise	Multi-Tech Systems (UK)	Techland Group	Vegastream
Telephone	01484 840 048	0845 458 4558	0118 959 7774	01628 852 000	01344 784 939
Supplier URL	www.provu.com	www.solwise.co.uk	www.multitech.com	www.techland.co.uk	www.vegastream.com
PHYSICAL					
Ethernet ports	1 x 10/100Mbps/sec	1 x 10/100Mbps/sec	1 x 10/100Mbps/sec	1 x 10/100Mbps/sec	1 x 10/100Mbps/sec
Total phone ports	1	4	2	2	10
FXO (PBX/line) ports	1	4	2*	2	10
FXS (phone) ports	1	0**	2*	2	0**
Other phone ports	N/A	N/A	2 x E&M	N/A	N/A
PSTN breakout	✓	✓	✓	✓	✓
PSTN failover	✓	N/A	✓	✓	N/A
Digital line support	✗	✗	✓ (on other models)	✓ (on other models)	✓ (on other models)
Local management port	✗	✓	✓	✓	✓
Remote management	✓	✓	✓	✓	✓
SIGNALLING PROTOCOLS					
H.323	✗	✓	✓	✓	✓
SIP	✓	Optional download	✓	✓	✓
Other	N/A	N/A	SPP	N/A	N/A
CODECS SUPPORTED					
G.711	✓	✓	✓	✓	✓
G.723	✓	✓	✓	✓	✓
G.726	✓	✗	✓	✗	✗
G.729	✓	✓	✓	✓	✓
Other	N/A	N/A	Proprietary	N/A	N/A
Silence suppression	✓	✓	✓	✓	✓
Adaptive jitter removal	✓	Not specified	✓	✓	✓
T.38 Fax over IP support	✓	✓	✓	✓	✓
Diffserv QoS	✓	✓	✓	✓	✓
NAT traversal technology	✗	✗	✗	✓	✓
Pros	Low-cost; neat interactive voice response system for initial setup	Straightforward deployment; all cables supplied; good local support from the distributor	Software-selectable FXO/FXS ports; legacy E&M ports; flexible phone book interface to support a range of applications	Simple port mapping for long-line extension applications; bandwidth optimisation technology	Ten FXO ports; analogue and digital models available; choice of management interfaces; FXS connectors
Cons	Single FXO port; complicated management interface and installation	Analogue only; support for either H.323 or SIP, but not both together	Can take a while for administrators to get to grips with its complexity	Documentation could be improved	Expensive
Overall	The single port limits its functionality but the Sipura gateway does a good job for firms with budgetary concerns	Lacks sophistication, but when it comes to basic long-line extension applications it gets the job done	It does a good job of supporting long-line PBX extensions and offers centralised monitoring and management	Good mid-range solution for both long-line extension and other VoIP applications	A flexible, well-engineered mid-range gateway with support for a large number of connections
SCORES					
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

* FXO/FXS functionality set in software; ** Models with FXS ports available



EDITED BY KELVYN TAYLOR

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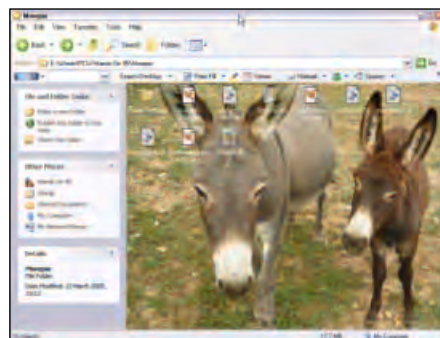
183 The definitive guide to Service Pack 2

The result of six months of extensive research, this guide will help you solve problems caused by installing SP2



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Gordon Laing finds out whether using a mobile CPU in a desktop PC can reduce noise and temperature



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Customise a folder to include a background picture with a little tweaking in Windows XP



PAGE 164

Find out how Spicemaster can liven up your movie transitions in our Digital imaging & video column

A very warm welcome to this month's Hands on section – if you're new to PCW, this is the part where we get to grips with problems we all encounter in our daily computing lives. Our team of experts is unrivalled in their combined real world experience and in their columns they're on hand to guide you through various aspects of their chosen disciplines.

In Question time we get a chance to answer your email queries, which pour in by the virtual sackful on a daily basis. Don't hesitate to send us your technical query or PC problem although, as you'll appreciate space is always limited for publishing replies. However, in some cases you'll find that your query prompts a whole column in reply.

We've a great selection of topics, kicking off with Gordon Laing's continuing attempts to make his home PCs quiet – this time he's decided to try the Pentium M mobile processor in a desktop system.

Ken McMahon's Digital imaging column deals with making professional-looking custom transitions in lots of popular video-editing programs using the Spicemaster plug-in, so if you're fed up with starbursts and tacky wipes then take a look.

Spreadsheets are an extremely popular topic with PCW readers – it seems that Visicalc has an awful lot to answer for. Stephen Wells has some neat tricks for making Excel warn you when your books aren't balanced.

Although Nigel Whitfield has relinquished the reins of editing Hands on to yours truly, he hasn't managed to retire to a life of luxury just yet, and this month he's been hard at work in Web development sorting out the problems caused by his own lack of planning when implementing CSS on his website.

According to Barry Shilliday, Linux isn't an operating system at all – it is simply the kernel itself. If you've always wanted to compile your own, he shows you how. No such possibility for Windows users, but Tim Nott will at least show you how to become a Super Being by using the hidden administrator account in Windows XP.

Configuration's the theme again in Tim's Word processing section, showing you how to automate the restoration of Word options. And for the network enthusiasts, Alan Stevens explains the use of the free Performance Monitor utility for troubleshooting.

Finally, our bonus feature gives you solutions to dozens of the most common problems in Windows XP SP2.

Kelvyn Taylor





Advice from our experts

Our Hands on experts answer your questions and solve your problems

Hardware

Q Most sellers of the NEC ND3520 DVD writer in the UK use the abbreviation OEM in the description. What does OEM mean and are there any implications with respect to firmware upgrades if I purchase an OEM model?

Paul Jones

A OEM stands for Original Equipment Manufacturer and refers to products or components designed to be sold under a different brand. Usually the difference between OEM and retail products is simply one of packaging. Retail versions come in colourful boxes with instructions and bundled software, whereas OEM versions (sometimes called 'brown box' versions) come with just the basics and no extras, and so cost a little less.

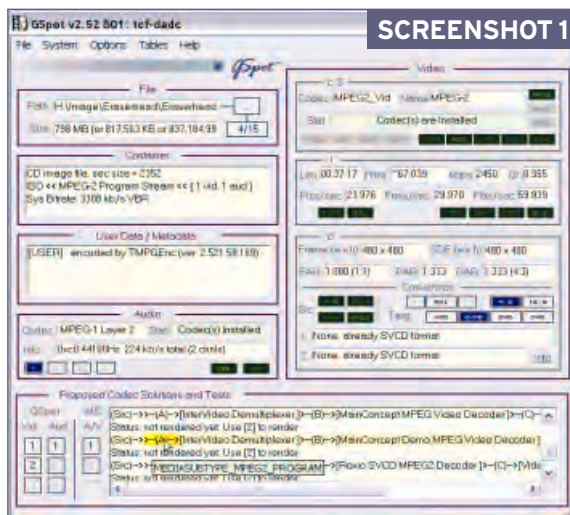
OEM components are traditionally bought by PC manufacturers who have no need for the extras and are after the lowest prices. The rise of online resellers has also seen OEM components being made available to end-users.

So it's entirely up to you whether to go for an OEM or retail version of a component – in most cases, the products are technically identical, so it's down to you if you'd like to spend extra for the retail packaging, manual and software or save a few pounds for the bare component. Note that OEM versions of processors may not come with heatsinks.

Q I've connected the TV output of my Asus A9550 graphics card to my TV set, but while it shows standard Windows programs, video files are only visible on the PC monitor.

Alph Anderson

A Video on PCs is generated using something called a video overlay, which previously was only visible on one display at a time. So in the past you'd simply have to choose whether you'd want to see the video on the monitor or TV set. Thankfully today it's possible to watch video on both screens simultaneously. Your Asus A9550 card is based on an ATI Radeon chipset and if you go to the Settings tab of your Display Properties and click on Advanced, you should see a tab referring to



Gspot is a free utility that can help you diagnose codec problems

Overlay. Here you'll see an option called Theater Mode. By activating this you'll be able to see video on both your TV and PC monitor at the same time.

Q I'd like to install the Betaplayer program on my HP 4700 PDA to watch DivX videos as described in the PCW May issue. I visited the Betaplayer website, but am confused as to which files I should download as there's versions for ARM, MIPS or SH3 processors. Which do I need?

John Varcoe

A The simple answer is none of them. In order to install Betaplayer via Activesync on your PC, just download and run the latest standalone betaplayer.setup.XXX.exe file (XXX being the version number) – this will automatically choose the right files for your PDA. The other files for specific processors are for if you want to download and install the program directly onto PDA itself, without the need for Activesync or a PC. The Betaplayer website is at <http://betaplayer.corecodec.org>.

Digital imaging

Q I am having trouble playing avi DivX files in Windows Media Player 10. The problem is unusual in that the first time that I attempt to play a DivX file after boot up it works OK. However, any subsequent time the result is very slow stuttering playback. The initial one second plays OK but then it is about one frame per second.

I have noticed that when the playback is slow, CPU usage is ramped up to 100 per cent (as monitored by Task Manager). The situation can be cured by rebooting windows, although this is very annoying.

My system is as follows: Acer Aspire 1630 laptop, Sempron 3000+ processor, 512MB of Ram, Nvidia Geforce Go 5200 graphics, Windows XP Home SP2, Windows Media Player 10 and DivX 5.1.2 codec.

Any clues or tips to solve this problem would be gratefully received.

Dr Alan Choo-Kang

A There are a number of potential sources for the problem. The DivX codec, your video card drivers, DirectX, or a conflict with another video editor or player are all suspects.

First make sure you are using the most recent drivers for your Geforce 5200 Go graphics card, which you can get from the Nvidia website.

You should also download and install DivX 5.2.1 from www.divx.com. You can use Gspot (www.headbands.com/gspot) to help diagnose codec problems and conflicts (see screenshot 1). Drop the DivX file into Gspot and click the Render button to determine the codec used for playback. Although you say you have the DivX 5.1.2 codec installed, it's possible that this is not the codec being used by Media Player.

You might also try using the open source Xvid mpeg-4 codec, (www.xvid.org) which can play DivX files, as an alternative. As a final thought, you say that CPU usage is 100 per cent, but there's an outside possibility that another application, not Windows Media Player is the culprit. Check the Processes tab of the Task Manager to make sure this isn't the case.

Databases

Q I want to set up an Access table with two fields, each to show currency values but in different currencies, pounds sterling and dollars. How can I do this?

Alice Horton

A The currency symbol that Access uses by default when creating a currency field is determined by the currency symbol setting in the Windows Control Panel. First, check your setting from Start,



Settings, Control Panel, Regional Settings, click the Currency tab and check that the currency symbol is £.

Then, in your table, create a currency field that will be used to hold sterling values. The format will be automatically set to £. Saving the table and flipping to datasheet view shows that the correct symbol is displayed.

At this point you could close the table, visit the Control Panel and change the currency symbol to \$. Then re-open the table and create a second currency field which will automatically pick up the \$ format from the control panel.

Alternatively you can set the format of the second field manually. With the Control Panel still set to £, you can create a second currency field, find the Format property on the General tab and type in: `$$,##0.00;($$,##0.00)` to format all values within this field with the dollar symbol.

Spreadsheets

Q If I use the NOW() or TODAY() functions to insert a date on an Excel worksheet it updates every time I open the file.

How can I use a function but retain the file's creation date?

Claire James

A You can create a simple custom function to do this. Press Alt&F11 to open the VBA editor. Choose Insert Module and type in:

```
Function Created()  
Created = ☒  
ActiveWorkbook.☒  
BuiltInDocument.☒  
Properties.Item(11)  
End Function
```

(Key: ☒ code string continues)

Close the VBA editor and Save the file. Choose the cell on the worksheet where you want the fixed date, then Function on the Insert menu, User Defined category and select, Created. Choose OK twice. Format the cell with a date format like d/m/yyyy.

Now whenever you open or recalculate this workbook the cell will always display the original creation date of the file as it's picking up the date that Excel shows under Properties, Statistics on the File menu.

Q I am recording wills and traditionally the lines are always filled. I use column A for numbering and enter all the text in column B.

Is it possible to justify text in a spreadsheet cell?

Jolie Ponsardin

A None of the current popular spreadsheets offer this, but that's because their cells are not designed to hold lots of lines of text. This is a job for a word processor offering tables, like Microsoft Word. A table's cells are comparable to the cells of a spreadsheet. The difference is they expect to hold a quantity of text and so offer a wide range of formatting options, including automatic word-spacing to fill out the lines (see screenshot 2).

Q I'm having a problem downloading items from the web into an Excel worksheet. Excel opens but then there's a virus scan of the file and on each of my add-ins and macros. This confuses the download so I don't receive anything. I use Norton Antivirus.

Carl Hindmarch

A Right-click on the Norton icon. Choose Configure Norton Antivirus. In the left hand panel choose Miscellaneous. In the right hand panel remove the checkmark against Enable Office Plug-in (see screenshot 3). You can always enable it again later.

Q Some time ago I created a Custom function in one of my Excel workbooks. Choosing it from Insert, Function, User Defined, I can use it in a cell, but now I would like to edit it. This function isn't listed if I choose Macros on the Tools menu. How do I view the code?

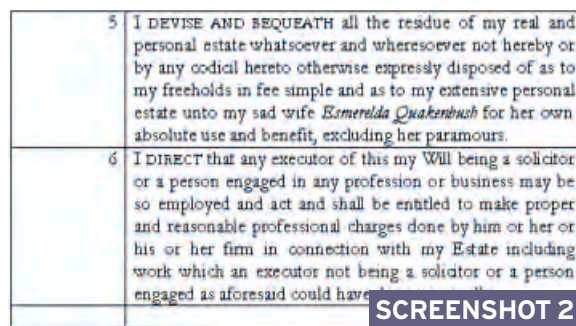
Clifford Linley

A With your workbook open, press Alt & F11 to open the VBA for Excel editor. Press F2 or choose Object Browser on the View menu. You'll find your Custom function listed under Members of <globals>. Right-click on the name of your function and choose View Definition. The code will be displayed and you can edit it if you wish.

Q Is it possible to point to an Excel cell and have a picture appear?

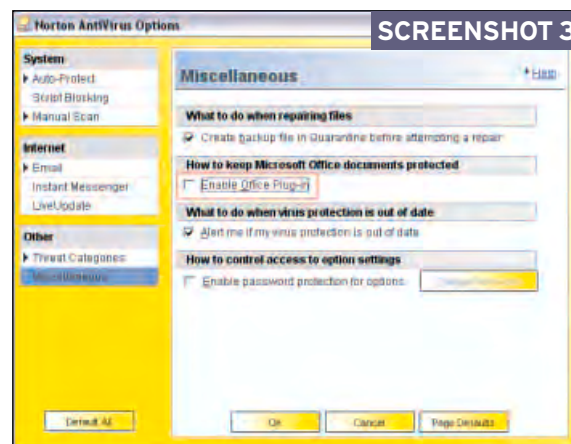
Nicolas Weill

A You could use a Comment to do this. Right-click on the cell and choose Insert Comment. Remove your name if it appears in the box. Point to the outer edge of the box until a cross made up of four arrows appears. Right-click and choose Format Comment and then the Colours and Lines tab. Click down the Fill Colour arrow and choose Fill Effects and then the Picture tab. Click the Select Picture button and choose



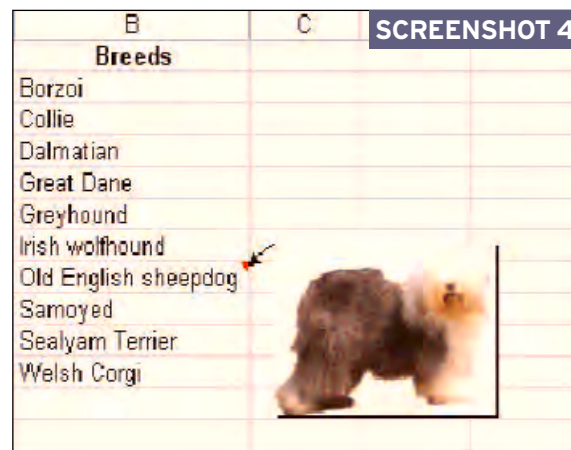
SCREENSHOT 2

Justifying text in a table using a word processing package



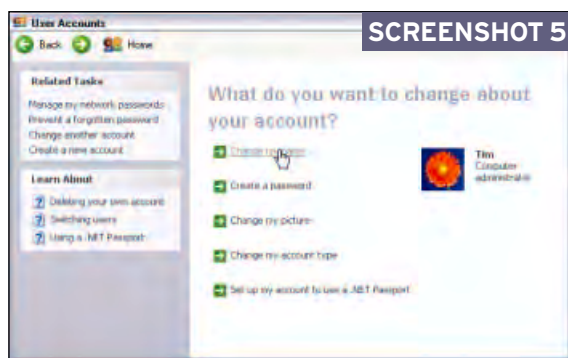
SCREENSHOT 3

Temporarily stopping Excel's automatic virus scan



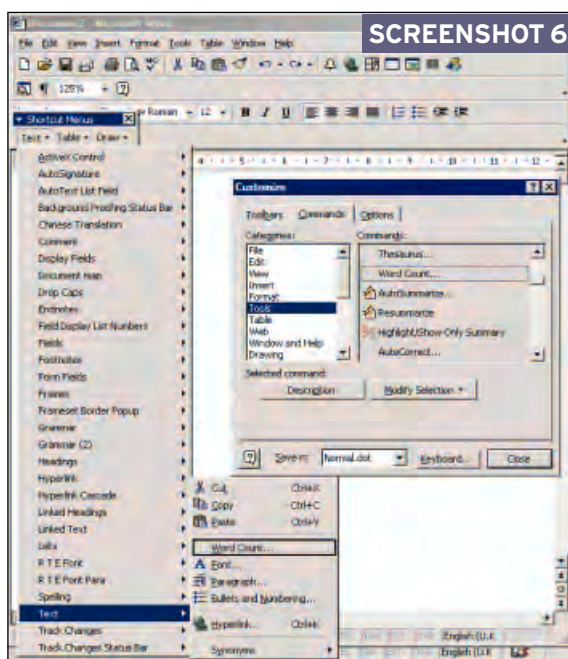
SCREENSHOT 4

A comment in Excel can be a picture



SCREENSHOT 5

You don't have to be 'User', you can change the setting to your name



SCREENSHOT 6

Customising the right-click menus



FIG 1

The Linksys Wireless-B Media Adapter

your picture, then click OK. You may have to pull down the bottom of the picture to compensate for any distortion. Under the View tab of Options on the Tools menu choose, Comment indicator only. Then the picture will only appear when you point to the cell (see screenshot 4).

Q Why is it that if an Excel cell is formatted as a percentage it displays 2500% when I enter 25?

Ron Doyle

A That's because Excel simply multiplies the entry by 100. However, in recent versions you can choose Options on the Tools menu and under the Edit tab check the item 'Enable automatic percent entry'.

Windows

Q I have a new PC with Windows XP and I would like to put my name to it. However, at the top of the Start Menu, the name reads 'User'. This also appears elsewhere, including the 'Registered to...' information in the System Properties, General page. How can I change this to my own name without having to re-load Windows?

Gerald Everett

A There are two steps here. First go to Control Panel, User Accounts and select 'User' – you'll find an option to 'Change my name' (see screenshot 5). If User is a Limited (non-administrator) account then you'll need to log off first and log back on to the administrator account. The 'Registered to...' information can't be changed via Control Panel – you need to edit the Registry. Again you need to be logged on with administrator rights.

First create a System Restore point, which will back up the Registry, then use Start, Run, 'Regedit' to launch the registry editor. Navigate to HKEY_LOCAL_MACHINE \SOFTWARE \Microsoft \Windows NT \CurrentVersion. (Yes, that 'Windows NT' key is correct).

Here you will find a value in the right hand pane named 'RegisteredOwner'. Double-click on this to change it to from 'User' to your own choice of name. There is also a 'RegisteredOrganisation' value that you can edit.

Word processing

Q If I open Word 97 and select Tools/Options I have all the tabs but I also have blank spaces under 'Compatibility', 'Edit' and 'Track changes'. I've re-installed Word 97, but the problems remain.

John Battersby

A This is usually caused by a corrupt settings value in the Windows Registry. The first thing to try is to start Word with the /a switch (Start, Run 'winword.exe /a'). This should load a clean, factory-settings version of Word. If the problem persists, then the problem isn't in the Registry and your only recourse is to reinstall Word from scratch.

If this cures the symptoms temporarily, then you can close Word and run the Windows Registry editor (Start, Run, Regedit). Navigate to HKEY_CURRENT_USER \Software \Microsoft \Office \8.0 \Word \Data where you will see two binary values named Settings and Toolbars. Delete both of these and Word will revert to the factory settings and rebuild the values next time it runs. If you want to preserve your existing options then see this month's Hands on word processing column on page 166.

Q In Microsoft Word 2003, if you go to File, Open, you get a window in which to select a file. On the left hand side of this window you have a side bar with icons 'Look In:'. How can I put an icon of the C:\ drive there or any other icon I want, such as a folder on the H:\ drive?

Jace Kalisto

A This is easy to do, but Microsoft keeps it well hidden. First navigate normally to highlight the drive or folder you want to add. Then open the Tools menu in the Open dialogue and select 'Add to My Places'. This works in Word XP and 2003.

Q I know it is possible to customise the Word XP toolbars and menus, but is it also possible to customise the right-click menu? I would like, for example, to select some text and count the words in the selection with a right-click rather than moving the pointer all the way up to the menu bar.

Gail Stephenson

A This is possible, but one problem is there are many menus, depending on what you are doing, such as graphics, tables or text; hence the name 'context menu'. To get at these, go to Tools, Customise and turn to the Toolbars tab. Scroll down and select Shortcut Menus from the list. You'll see a floating toolbar appear with menus entitled Text, Table and Draw. The Text menu leads to 30 submenus in Word 2000 (40 in 2003), each of which produce an actual context menu. So, if you open Text, Text you'll get the standard text editing context menu with Cut,



Copy, Paste, some formatting commands and synonyms. Leaving this open, you can then go back to the Customise dialogue, switch to the Commands tab and drag the commands you want onto the open menu (see screenshot 6).

Networks

Q I recently bought a Linksys Wireless-B Media Adapter (see fig1) (reviewed in *PCW* October 2004) so I could stream my digital music collection and photos to my hifi and TV. But no matter what I do, I can't get it to work with Windows XP SP2.

I've followed the supplied instructions, but after powering on, the adapter just sits there saying 'Waiting for Host'. The adapter's wireless light is on and I can see it on my wireless network. On the web I've found a number of similar complaints – do you have any solution or should I return the hardware for a refund? There's no mention of compatibility problems on the Linksys website and no new versions of the software available to download.

Dian Leach

A You're in luck as we've found a workaround for this problem.

The problem is that the Wireless-B adapter was one of the first generation of streaming devices and the software hasn't been updated by Linksys since 2003, well before XP SP2 arrived. The product itself is nearing end of life and can now be picked up cheaply, but with a few tweaks to your Windows firewall it's possible to get it working properly. Unfortunately the solution below only works with SP2 – with XP SP1 you will need to turn off the Windows firewall altogether – not a good idea unless you're not connected to the Internet or you have a router with a Nat firewall. A Nat firewall shouldn't affect operation of the media adapter – it's only filtering traffic that originates outside the local network.

What's happening is that the Windows firewall is blocking incoming TCP/IP requests from the Media Adapter to the Adapter Utility program that sits in your System Tray. So, when the adapter starts up, it's prevented from talking to the host PC and retrieving the media information. We realised this after finding that we could ping the adapter from the host PC – open a command prompt and type 'ping XXX.XXX.XXX.XXX (Xs being the adapter's IP address) with no problems.

To fix this, you need to add the Linksys process that communicates with the Media Adapter to the Windows firewall's Exceptions list.

During installation, only three processes appear to be added to this list, but another needs to be added.

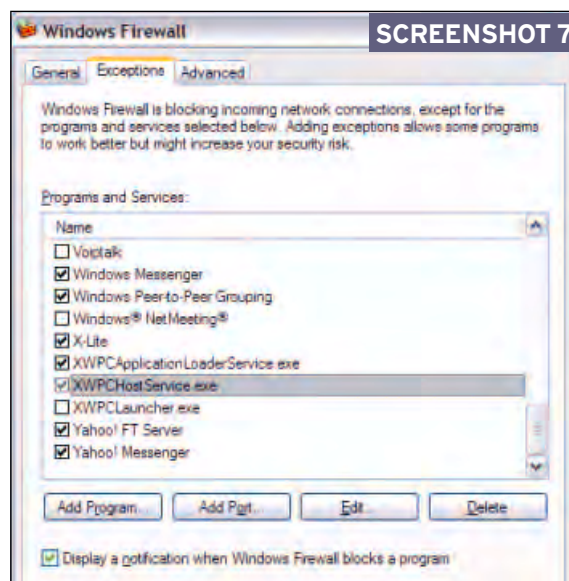
The processes added to the Exceptions list during installation are all found in the \bin subfolder in the installation directory (by default this directory is called \Linksys Wireless-B Media Adapter in your Program files directory): XwpcShareFolderCommand.exe, SharedMediaManager.exe and XWPCHostService.exe (see screenshot 7. In our case, the first two don't have a visible name in the Exceptions list – the entries appear blank (see screenshot 8), but highlighting these and clicking on the Edit button reveals the details.

The extra process is also found in the \bin folder, and is named XWPCApplicationLoaderService.exe.

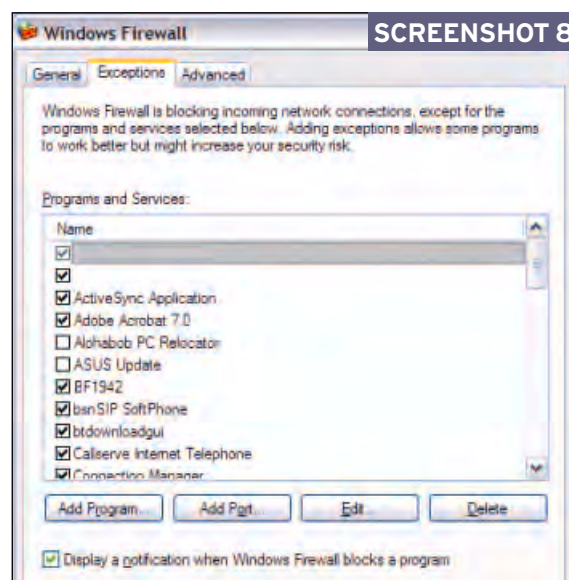
To add this to the Exceptions list, open the Windows firewall applet in Control Panel, navigate to the Exceptions tab, click Add Program, click Browse and navigate to the folder containing this file. Click Open, then OK, then make sure the check box next to its name in the Exceptions list is checked. Now click OK to close the firewall configuration and try powering on the Media Adapter again. After the 'Waiting for Application' screen you should now see 'Downloading Adapter Image' and a couple of other messages before reaching the main user interface on your TV. If you're using a third party firewall, you need to find out how to allow this program to accept incoming connections.

However, there's another gotcha in store. The Linksys software uses the Microsoft .Net Framework version 1.0.3705 (provided on the setup CD), and it won't work at all with any later version. Unfortunately, if you have Windows' Automatic Updates enabled, it will decide to add a couple of patches to the .Net Framework, with predictable results. The easiest way to get rid of these patches, if they've installed automatically, is to use the Add/Remove Programs applet in Control Panel (make sure you click the 'Show Updates' check box).

After uninstalling the patches you shouldn't get reminded again to install them, but if you do, decline. Of course it's not good to refuse patches, but it's the only workaround we're aware of. If you have other programs dependent on higher versions of the .Net Framework such as 1.1 or 2, there shouldn't be a problem, as the .Net Framework is designed to allow multiple versions to run side-by-side and installing these versions won't overwrite your version 1 installation.



Make sure your Exceptions list contains the Host Service and Application Loader Service programs – but the XWPCLauncher.exe program can be left unchecked



Two of the installed Media Adapter components are unnamed in the Exceptions list

CONTACTS

All of our experts welcome your queries, simply respond to the appropriate address below:

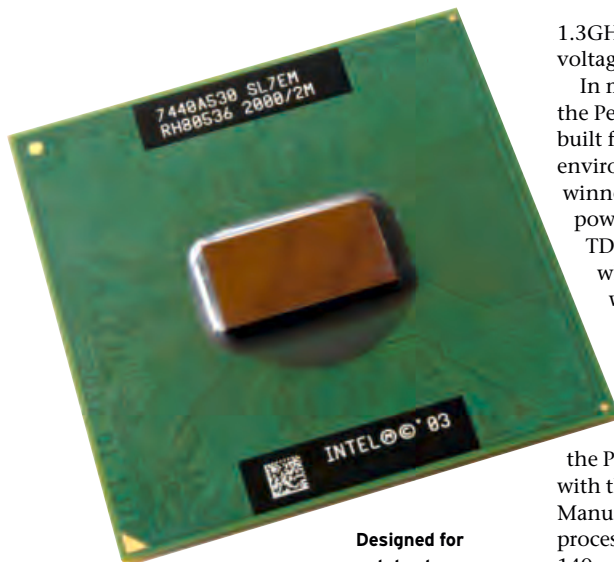
Databases: database@pcw.co.uk
 Digital imaging & video: digitalimaging@pcw.co.uk
 Hardware: hardware@pcw.co.uk
 Linux/Unix: linux@pcw.co.uk
 Networks: networks@pcw.co.uk
 Overclocking: overclock@pcw.co.uk
 Sound: sound@pcw.co.uk
 Spreadsheets: spreadsheets@pcw.co.uk
 Visual programming: visual@pcw.co.uk
 Web development: webdev@pcw.co.uk
 Windows: win@pcw.co.uk
 Word processing: wp@pcw.co.uk
 Please do not send unsolicited file attachments.

**Gordon Laing**

has been a hardware enthusiast ever since his first Sinclair ZX80 and, as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing

Searching for the ultimate CPU

Find out how mobile CPUs can offer a way to build a quiet, cool desktop system



Designed for notebooks, Intel's Pentium M processor could make the ultimate quiet desktop system

As PC components increase in performance, a rarely-mentioned casualty is increased power consumption. According to Intel's specification sheets, the Thermal Design Power (TDP) rating of a 3.4GHz Pentium 4 is no less than 115w, almost 10 times greater than the original 60MHz Pentium. Of course, it's considerably faster, but should we always accept that speed comes at the cost of power?

Believe it or not, there is an alternative processor, which matches the performance of top-end Pentium 4s, while consuming a fraction on the power and generating so little heat that it can be cooled without a fan. It may have been designed for notebooks, but it could end up being the ultimate desktop CPU.

Enter the mobile

For low-power PC processors, look no further than those designed for the mobile market – after all, when power consumption relates directly to battery life, the chip designers pull out their best tricks.

One of the most powerful mobile processors today is the Intel Pentium M, originally launched in March 2003, with the 855 chipset as the core of the new Centrino platform. The first Pentium Ms employed a newly-designed micro-architecture with 77 million transistors manufactured using a 130nm process. They had a 1MB Level 2 cache, support for SSE2, ran on a 400MHz quad-pumped bus and were available at speeds of

1.3GHz to 1.7GHz. Low and ultra-low voltage models were also produced.

In many respects, taking the best of the Pentium III and Pentium 4, but built from the ground-up for mobile environments, the Pentium M was a winner in terms of performance and power consumption. They had a TDP rating of 22w to 24.5w and when Pentium M notebooks were tested on mains power, they often out-performed Pentium 4 Mobile and even Pentium 4 desktop systems clocked considerably faster.

This time last year the Pentium M was upgraded with the improved Dothan core. Manufactured on a finer 90nm process, the Dothan core featured 140 million transistors, most of which were accounted for by the larger 2MB Level 2 cache. Both 533MHz and 400MHz buses were supported and a new 915 mobile chipset brought up-to-date features like support for PCI Express and dual-channel DDR-2 memory. Dothan processors were introduced at 1.5GHz and are now available at up to 2.13GHz, with a TDP rating of 21w to 27w.

Around the same time, Intel also applied its processor numbering system and chose 7xx for the Pentium M. While Intel is keen to stress this number refers to a combination of features, rather than just relative power, it's revealing that the traditional single-core Pentium 4 range is numbered 5xx. The Dothan Pentium M processors range starts with the model 715 (1.5GHz/400MHz bus) and, at the time of

writing, ramped up to the model 770 (2.13GHz/533MHz bus).

Fast, cool and economical to run, the Pentium M appears to have it all, but sadly there was no way to build a desktop system with one – until now.

Aopen's motherboard

Towards the end of 2004, Aopen announced the first desktop motherboard designed for Pentium M processors. The i855GME-LFS microATX motherboard is based around the same 855GME chipset as the original Centrino platform, with integrated graphics, support for USB2 and up to 2GB of DDR memory running up to 333MHz.

Unlike a notebook motherboard though, there are full-sized slots and connectors for standard desktop components, including an AGP 4X slot for improving the on-board graphics. There are also three PCI slots, along with on-board dual Gigabit Lan, Firewire and Serial ATA, as none are included in the ageing ICH4-M chipset component.

The board is dominated by the processor socket, which Aopen describes as Socket 479, although the processors it takes are technically Socket 478 packages – Socket 478 Pentium 4s and Celerons are not electrically compatible.

The i855GME motherboard is designed only to work with Pentium M processors, supporting Banias and newer Dothan models, although only the 400MHz bus versions. Rather than use a traditional Zero Insertion Force (Zif) lever to secure the CPU, the Aopen motherboard employs a socket screw, which must be turned anti-clockwise to allow the processor to be inserted then turned clockwise to lock it in place.

Aopen has chosen to employ the standard Pentium 4 heatsink retention hole spacing on the motherboard, but supplies its own low-profile heatsink and fan with the board. This is because the Pentium M doesn't employ a heat spreader on its die and has a physically lower profile than the Pentium 4.

For this reason, Aopen strongly recommends only using its supplied cooler, although Pentium 4 heatsinks, which bypass the plastic retention clips and mount directly onto the four motherboard holes, may be able to maintain decent contact with the

Aopen's i855GME-LFS is the first desktop motherboard designed to take the Pentium M processor





die. The Aopen motherboard costs £145 (£124 ex VAT) from PC Next Day (www.pcnextday.co.uk).

Of course, none of this is any use without a Pentium M processor, but fortunately these are available from several suppliers. At the time of writing, Ebuyer sold the model 725 (1.6GHz/400MHz bus) for £138 (£117.48 ex VAT) and the model 755 (2GHz/400MHz bus) for £280 (£238.19 ex VAT).

Test setup

To see whether the Pentium M would make a viable desktop solution, I tested the Aopen motherboard with the Intel 725 and 755 processors and Aopen's supplied heatsink. To ensure memory wouldn't be a bottleneck I fitted a pair of 512MB Kingston Hyper-X DDR modules, although it should be noted the 855 chipset has a single-channel memory controller, operating at a maximum of 333MHz.

To ensure quiet operation, the system was powered by a fanless Silentmaxx 423w PSU. Finally, Windows XP Professional with Service Pack 2 was installed on an 80GB Seagate hard disk.

The Aopen Bios offers several fan control options under the 'Silent Bios / HW Monitor' section. Setting the Fan mode to 'Smart Control' leaves the fan switched off until the core has reached a user-defined critical temperature. At this point the fan automatically comes on until the temperature is reduced below the critical point. Intel's specification sheets for the Pentium M state its maximum operating temperature is 100°C, so I chose the highest offered in the Aopen Bios of 70°C.

Results

As the PC booted up, the supplied fan spun virtually inaudibly for a few seconds before switching itself off, allowing the system to run in complete silence other than the faint clicks of the hard disk. Every few minutes as the CPU temperature reached 70°C, the fan would power-up for a few seconds at a time. Once the fan was off again, the system was eerily quiet.

I then ran Sysmark 2002 to compare the configuration with earlier systems tested in Hands on Hardware. With the 1.6GHz Pentium M 725 it scored 230, with 277 in Internet Content Creation and 191 in Office Productivity. Switching to the 2GHz Pentium M 755 saw the score increase to 259, with 315 in Internet Content Creation and 213 in Office Productivity.



Maplin's plug-in mains power and energy monitor lets you measure precisely how much power a device is consuming. It costs £24.99

To put this in perspective, a 2.4GHz Pentium 4A system, with the same 400MHz FSB, disk and memory scored 222 in Sysmark 2002, which was less than the 1.6GHz Pentium M. To match the 1.6GHz Pentium M, I had to overclock the 2.4GHz Pentium 4A to 2.52GHz, and to match the score of the 2GHz Pentium M, I had to overclock the 2.4GHz Pentium 4A to 3GHz.

To measure power consumption, I used a Plug-In Mains Power and Energy Monitor, costing £24.99 (£21.27 ex VAT) from Maplin (www.maplin.co.uk). This handy device sits in-between the mains plug of the device in question and a mains socket. The LCD can then either show the voltage, current, power or frequency.

The basic Aopen Pentium M system with 2GHz processor, 1GB of Ram, on-board graphics and 80GB hard disk consumed around 42w while running Sysmark; this reached highs and lows of 53w and 38w respectively. In contrast, the 2.4GHz Pentium 4A system clocked normally, with the same memory and disk, albeit with two PCI TV tuner cards and a basic AGP graphics card, consumed an average of 145w, with a peak of 155w and a low of 122w.

Both systems

consumed 8w when put into S3 suspend-to-Ram standby.

Clearly, this needs to be a more level playing field to directly compare the platforms, so next month I'll be doing further power tests. That said, I still expect a stripped down Pentium 4 system to consume two or three times more power than the Pentium M. Remember the Pentium M is also quieter and quicker.

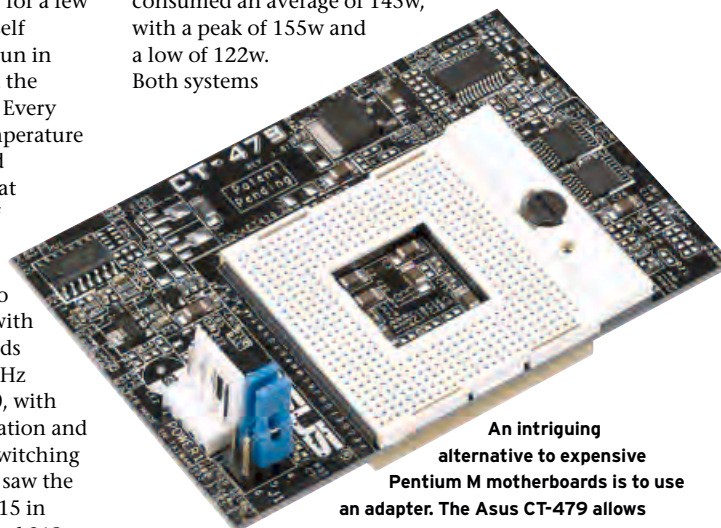
The ultimate platform?

These initial tests certainly paint a very favourable picture of the Pentium M as a desktop solution, showing it to be quicker, less power hungry and potentially much quieter than a Pentium 4, even when the latter's clocked 50 per cent faster. The one thing I've not compared yet is cost: at the time of writing, the price of a 1.6GHz Pentium M could buy you a 3.2GHz Pentium 4, which will outperform it overall especially in terms of media encoding.

Then there's the Aopen motherboard, which at £146 (£124 ex VAT) costs typically double that of a Pentium 4 motherboard, while not having the same level of connectivity and features. So, today, a complete Pentium M desktop system will cost more than one based on a typical Pentium 4, but you'll be getting something that consumes far less power and generates so little heat it could be cooled without any fans – to do that with a Pentium 4 would require pricier cooling solutions.

This could make a Pentium M the ultimate platform for a media PC, running silently and economically, while delivering sufficient power to handle high definition video. In next month's hardware column I'll be seeing how well Windows XP Media Center Edition could run on a Pentium M platform. I'll also see if it can be cooled passively with a decent Pentium 4 heatsink alone.

In the meantime, the market for Pentium M desktop solutions is growing: DFI now has an 855-based motherboard, and Asus offers a £25 adapter, which allows Pentium Ms to work in certain Pentium 4 motherboards. Aopen will soon be selling a Pentium M motherboard based on the more up-to-date 915 chipset with support for 533MHz bus CPUs, dual-channel DDR-2 memory and PCI Express graphics.



An intriguing alternative to expensive Pentium M motherboards is to use an adapter. The Asus CT-479 allows you to use Pentium M chips on some of its standard Socket-478 Pentium 4 motherboards

CONTACTS

Gordon Laing welcomes your comments on the Hardware column. Email him at: hardware@pcw.co.uk. Please do not send unsolicited file attachments.



Gordon Laing has been a hardware enthusiast ever since his first Sinclair ZX80 and, as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing

Overclocking a Pentium M

How overclocked mobile processors can be a viable option for desktop systems

In this month's Hands on Hardware column on page 154, I tested Intel's Pentium M processor in the Aopen i855GMem-LFS motherboard. The Pentium M may have been designed for mobile environments, but actually makes a surprisingly compelling option for desktop systems.

It performs as fast as a Pentium 4 clocked up to 50 per cent faster, while consuming less power and generating less heat. These, in turn, allow you to build a system that's quiet and cool, while being very economical to run.

The Aopen motherboard was the first solution that allowed you to build a desktop system with a Pentium M processor and it's already spawned several rivals and a lot of interest in the enthusiast community.

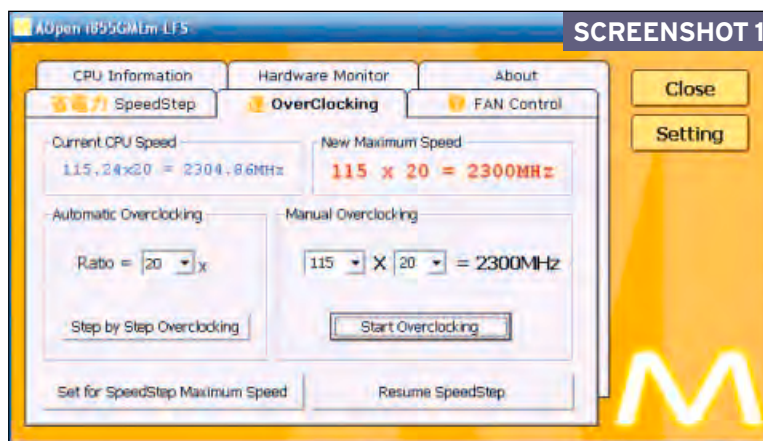
As a mobile processor, the Pentium M offers battery-saving options where the voltage is reduced and the chip underclocked. Of course, the question is whether the Pentium M can be pushed the other way and overclocked for superior performance.

Test setup

To test the overclocking capabilities of the Pentium M processor, I used the same configuration as this month's Hands on Hardware: the Aopen i855GMem-LFS motherboard with on-board graphics, two Kingston 512MB Hyper-X DDR Dimms and 80GB Seagate hard disk loaded with Windows XP Professional/Service Pack 2. In order to compare the results with previous Hands on results, I ran Sysmark 2002 at a resolution of 1,024 x 768 in 16bit colour.

I tested the Pentium M models 725 and 755, which are clocked at 1.6GHz and 2GHz respectively. Cooling was provided by Aopen's low profile heatsink and fan, supplied with the motherboard.

As explained in the Hardware column, the Pentium M die is lower than the Pentium 4, so while the Aopen board can physically accommodate Pentium 4 heatsinks, those models employing the standard retention mechanism won't maintain sufficient pressure on the CPU die in order to cool it effectively.



It's easy to overclock the Pentium M in Aopen's i855GMem-LFS motherboard, either from the Bios or this supplied Windows utility

It may be possible to cool the Pentium M using Pentium 4 heatsinks, which bypass the retention clips and mount directly onto the four motherboard holes – this is something I'll investigate next month.

Results

With the 2GHz Pentium M 755 fitted, the test configuration scored 259 in Sysmark 2002, with 315 in Internet Content Creation and 213 in Office Productivity. This processor employs a 100MHz bus quad-pumped to 400MHz and a fixed 20-times multiplier to deliver the 2GHz clock. The Aopen motherboard allows you to adjust the bus speed in the Frequency section of the Bios or using a Windows utility, (see screenshot 1). I used the former, as Sysmark shuts down utilities when running.

With the bus increased from 100MHz to 110MHz, the processor was overclocked to 2.2GHz. The system ran stably at the standard 1.34v for the Dothan Pentium M and scored 281 in Sysmark 2002, with 349 in Internet Content Creation and 226 in Office Productivity.

I then tried to increase the bus by a further 10MHz to 120MHz, thereby overclocking the processor at 2.4GHz, but Windows refused to start. At this point, the overclocker would normally try and increase the core voltage to re-introduce stability, but the Aopen Bios didn't offer any higher voltages as standard. With a Dothan processor fitted, it offered a selection of lower voltages but none higher than the standard 1.34v.

The only option was to reset the Bios and set the bus to 115MHz, resulting in an overclock of 2.3GHz. The system booted without a hitch,

scoring 305 in Sysmark 2002, with 371 in Internet Content Creation and 251 in Office Productivity.

Switching to the 1.6GHz Pentium M 725 model, Sysmark scored 230, with 277 in Internet Content Creation and 191 in Office Productivity when clocked normally. This time I skipped the 110MHz bus and went straight to 115MHz, overclocking the processor to 1.84GHz. The system ran stably, scoring 263 in Sysmark 2002, with

310 in Internet Content Creation and 223 in Office Productivity. Again I was unable to increase the bus beyond 115MHz.

Lots of potential

These scalable results show the Pentium M has a lot of overclocking potential, and the 90nm manufacturing process of the Dothan chips should have plenty of headroom for high clock speeds. Unfortunately, the limiting factor in this month's configuration was the inability to increase the core voltage beyond the standard 1.34v.

On Intel's specification sheets for the Dothan Pentium M processors, you'll see a series of pins, which instruct the motherboard what voltages should be offered. With a little modification to the right pins, you could trick the motherboard into delivering higher voltages, thereby allowing more significant overlocks.

I'll leave this modification for a later edition but, in the meantime, several enthusiasts have reported greater overclocking potential with the Pentium M motherboard from DFI.

As a final note, it was reassuring to find my Pentium M didn't run appreciably hotter when overclocked. The Bios-controlled fan still only switched itself on for a few seconds at a time and spent most of the time powered-off in complete silence – not bad considering the processor was running 15 per cent faster.

CONTACTS

Gordon Laing welcomes your comments on the Overclocking column. Email him at: overclock@pcw.co.uk. Please do not send unsolicited file attachments.



Tim Nott
is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family

Becoming a super user

A tip for administrators, customising folder backgrounds and avoiding a display problem

If you have sufficient disk space and your PC is used by more than one person, it makes sense to set up each user with their own user account.

This has been possible since Windows 95, but Windows XP has made it easier and more robust than earlier versions. Different user-accounts mean that everyone can have their own settings, access their own mailbox – without having to fiddle with Outlook Identities – and be prevented from messing up other users' files or the system.

We've covered setting up administrator and restricted users in depth before, but here's a useful tip. In a family situation you'll usually want to use the Welcome screen – on starting the computer each user can choose their ID, which may or may not be password protected. Although a user may have administrator status, there is a 'super-administrator' account that doesn't appear on the list – if you installed XP yourself, you would have been prompted to supply a password for this. In XP Professional and XP Home, the administrator account has a blank password by default, something you should change as soon as possible. If you press Control & Alt & Del twice at the Welcome screen, you will find that a conventional Windows 2000-style log-in box appears and you can type in the relevant account name and password (see screenshot 1).

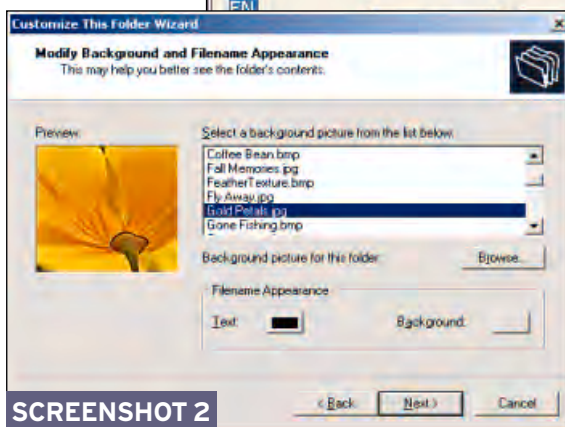
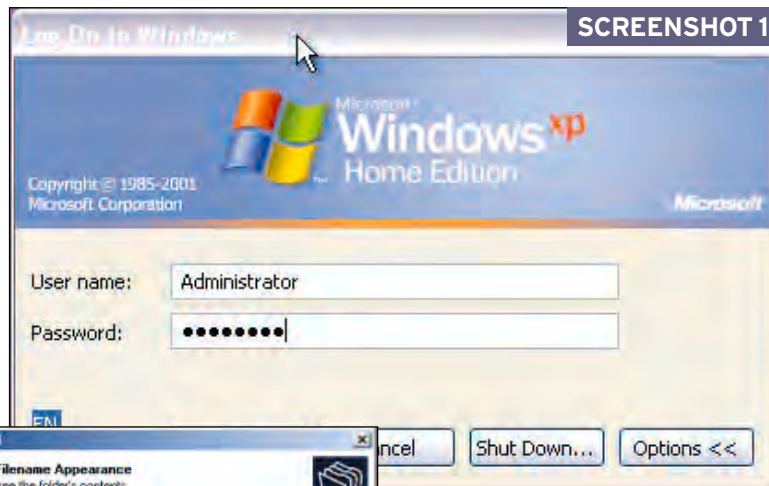
Background

One thing it was possible to do in Windows 98, ME and 2000 was to customise a folder to include a background picture. Screenshot 2 shows how it's done in Windows 2000, after going to 'View, Customise this folder...'. Under Windows XP you can go to the corresponding menu item and change the icon of a folder as well as putting a picture on the front of the closed folder in thumbnail and filmstrip views.

There is, however, no provision for assigning a background image inside the folder. Sharp-eyed reader Nick Hawryliw noticed that a suitably-customised folder from a Windows 2000 installation kept its background image when copied to an XP system. This shows that the underlying mechanism is still in place even

Right: You can get the conventional log-in box from the Welcome screen

Below: Applying a background folder image in Windows 2000

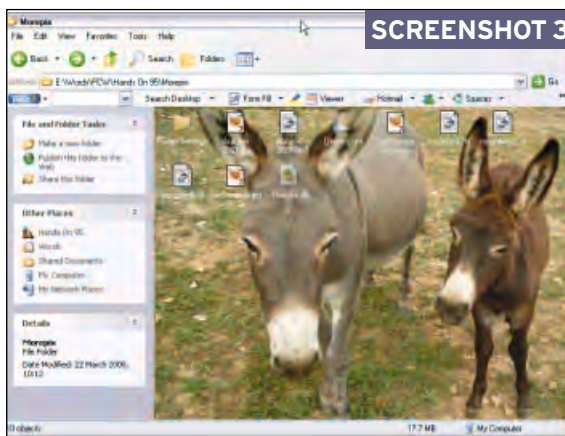


SCREENSHOT 2

though the option has been removed from the user interface.

So, if you don't have a conveniently customised copy of Windows 2000, Me or 98 for use as a source, here's what you do. First, log in with administrator status, go to Folder Options, View and make sure that 'Show hidden files and folders' is selected, 'Display the contents of System folders' is checked, and that 'Hide protected operating system files' is unchecked. Next, open the target folder and create a new text

Putting a background picture into a folder can be done in XP with tweaking



SCREENSHOT 3

document. Change its name from the default 'New Text Document.txt' to 'Desktop.ini'. Ignore the warning about the file becoming unusable – you will still be able to open it in Notepad, which is the associated application for .ini files. Having opened it add the lines:

```
[{BE098140-A513-11D0-A3A4-00C04FD706EC}]
IconArea_Image=path_to_image
```

(Key: ✓ code string continues)

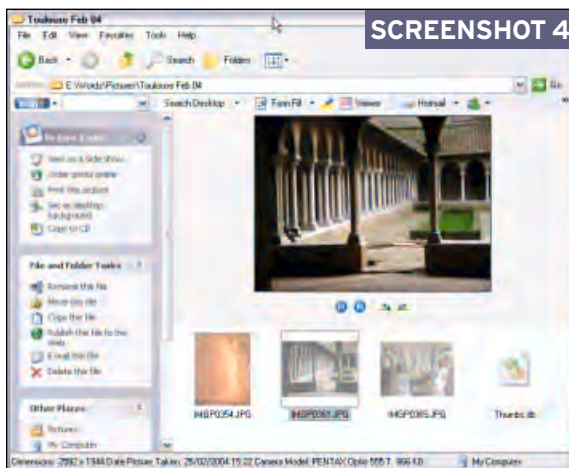
Replace 'path_to_image' to suit – in Windows ME and 2000 a copy of the image is stored in a subfolder of the target named 'Folder Settings' and IconArea_Image points to the copy – this keeps things organised, but isn't compulsory. Save Desktop.ini and exit Notepad.

Then you need to make the target folder into a system folder by assigning the system attribute. Although you can do this from the command prompt, there's a shortcut that involves minimal keying effort. Move up one level to the parent of the target folder and with that folder in the foreground, go to the Windows Start, Run box and type attrib +s followed by a space. Leave the Run box open and go back to the parent folder, then drag the target folder into the Run box and press OK. Your folder should display the chosen background image. If this makes the file name and details hard to read then you can change the text colour.

Open the Desktop.ini file again and add the line:

```
IconArea_text=0x00FFFFFF
```

and press Enter. Save Desktop.ini and



the text will now be white. You can have any colour you like with a little editing. The last six characters (FFFFFF in our example), give the blue, green and red components of the colour, each being represented by a two-digit hexadecimal code ranging from 00 to FF (255 decimal). So 0000FF for example, would produce bright red text, but you can choose any combination of values from a choice of 16,777,216. (see screenshot 3).

Faded pictures

There are a number of image-processing programs that can apply a faded look to your photos. Even Microsoft Word can do this if you want, for instance, to layer text on top of an image. What's more puzzling is when Windows XP starts doing this spontaneously to your image thumbnails. What's stranger still is that the images themselves are not affected and in filmstrip view the larger image of a selected thumbnail is unaffected by the faded effect (see screenshot 4).

This phenomenon took some tracking down, and it turns out to be a combination of two things. First, in the View tab of Explorer's folder options, the option to show hidden files is turned on – something I'm sure all red-blooded Hands on readers do as a matter of course. Second, the affected files have their hidden attribute set.

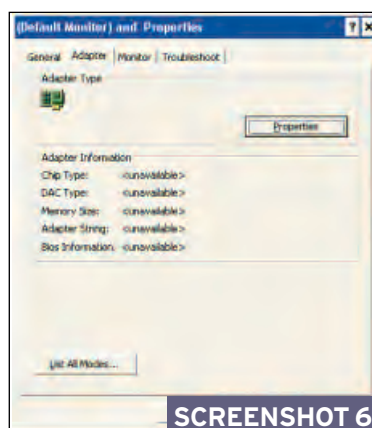
Why anyone should want to set this attribute for a picture file beats me, except as a very ineffectual way of hiding 'unsuitable' content, but as we all know, these things can happen by a slip of the finger, by cats on the keyboard or forces beyond our control. Anyway, if you select all the affected files, right-click and choose Properties, you'll be able to clear the hidden attribute and the thumbnails will be restored.

Another fine gotcha

This column prides itself on finding new ways to get into trouble and this month is no exception. Having moved house, the outbuilding – destined to be the new office – still lacks essentials, such as doors, windows and electricity. So this column is sharing a bedroom with the family computer and the bedroom's occupant. As we're still on CRT technology, this means fitting two large monitors in a very small space.

Plan A was to transfer data and settings from the family PC to the work PC, then store the family PC and the larger of the two monitors until the office was ready. However, on plugging the office PC into the smaller Eizo monitor, the latter reported that the frequency of the signal it was receiving was out of its range, so it wouldn't display it and that this message would disappear in 30 seconds. Although the monitor is fairly old, this is correct behaviour: some monitors can be damaged by an out-of-range signal.

No problem, I thought – restart in Safe Mode. It was then I discovered a rather fine gotcha. In safe mode the drivers for the Matrox display adapter were not loaded – what I got was a generic VGA driver. So I couldn't alter



SCREENSHOT 6



SCREENSHOT 5

Top left: The strange case of the faded thumbnails

Top right: Turn down the resolution while you still can

turn down the display settings before you lug that big heavy monitor up to the attic (see screenshots 5 and 6).

A rose by any other name

On the subject of gotchas, Gerald Everett's request in this month's Question Time reveals another. If you change a user name from the 'User' created by the supplier to your own choice – let's say 'Rose' – you'll find that although this is reflected in the Welcome screen and the Start Menu, and that you now have folders for 'Rose's Documents', 'Rose's Music' and so on, the latter are still contained in a folder named 'User'.

Do not be tempted to rename this folder – depending on the current administrator status and user ID you may find Windows won't let you. Windows may warn you that certain shared folders won't be accessible or you may find you get no warning at all. In any case, should you succeed in renaming the folder you'll lose all the personal settings for the artist formerly known as 'User', including Outlook Express IDs and messages, Favourites, Documents and so on. The name 'User' lingers on in various Registry Locations and elsewhere, and if Windows can't find the folder, it will create a new one with default settings. If you've done this, then delete the new 'User' folder and rename 'Rose' back to 'User'.

If you really can't live with the folder name 'User', then the best thing is to create a new user named Rose, copy the various files and settings from the User folders and when you're satisfied that Rose has all she needs, delete the User account.

CONTACTS

Tim Nott welcomes your comments on the Windows column.
Email him at: win@pcw.co.uk.
Please do not send unsolicited file attachments.

Not so safe – a display adapter gotcha

**Barry Shilliday**

has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but in his free time prefers to travel the world – and snap it with his camera

Stripping down the Linux kernel

Everything you always wanted to know about the core of the Linux operating system

Few people realise that Linux is not a full operating system. Linux is, in fact, the kernel alone – the applications, desktops, even the simple standard Unix utilities are all separate and not part of Linux itself. For that reason, some people prefer the term GNU/Linux to refer to the OS, since most of the essential utilities required to run Linux rely on GNU software. These include the compiler, the main system libraries and the standard tools. This month, we'll look at the Linux kernel – what it is and how to compile your own.

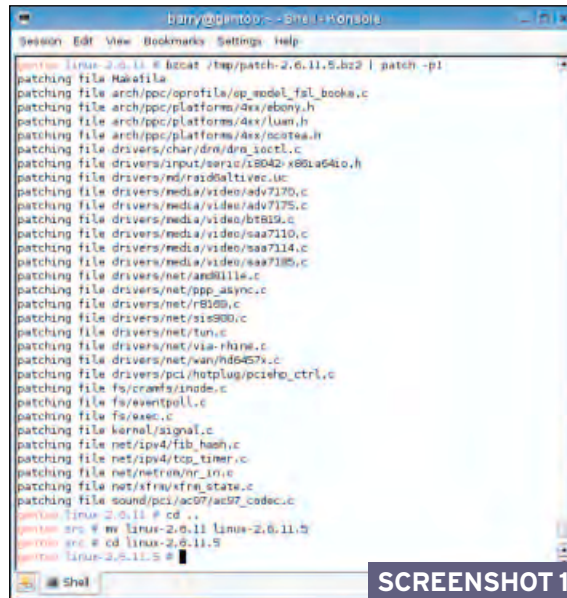
First, what is the kernel? On any Unix system, the kernel is the core of the OS. It provides access to the computer's hardware – the disk drives, the memory and so forth. It also provides a protected and secure environment for programs to run in. There's an impenetrable line between the kernel and the applications: the kernel maintains all the resources for the applications, but doesn't run anything itself. Applications cannot affect each other directly and they cannot access hardware directly – everything must be done via the kernel, which has full control over the computer. It's because of this separation that additional utilities are needed to make up the Linux OS. Since all programs ultimately have to access the kernel to do anything, it's not surprising that this part of the system is the most important.

There are various user interfaces to the kernel, all of which run outside of it in what's known as user-space. For a simple text login prompt, the 'getty' program authenticates the user and then launches a shell for them to run commands.

Alternatively, you can run programs via a graphical desktop and authenticate using desktop managers like KDE's kdm. An mp3 player running Linux would have its own program to control input and display the track information. A common misconception is that Linux is a text-based OS with the option of running a GUI on top. This is untrue; the shell is just another interface like any other.

Kernel numbers

The development of the Linux kernel began in 1991 when Linus Torvalds requested help on the Internet with



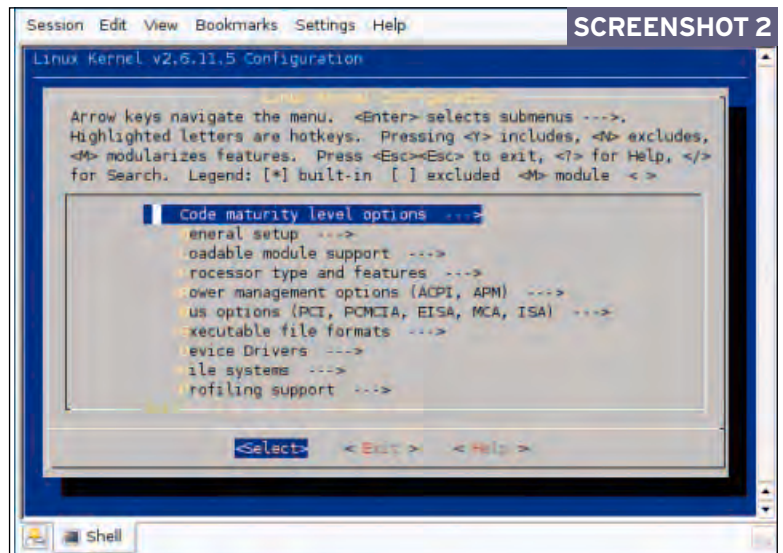
Upgrade kernel sources by applying patches

his project. In 14 years of development there's nothing left of the early code and, of course, there has to be a way to distinguish between each release. Up until this year, the numbering system was as follows. A kernel release had three numbers: a major number, a minor number and a patch level. An example is 2.4.20. The major number represents a substantial change in the kernel – a change so dramatic that in all these years we're still only on version two. The minor number is what really describes a new version of the kernel – this will mean significant developments, complete rewrites of much of the code, support for

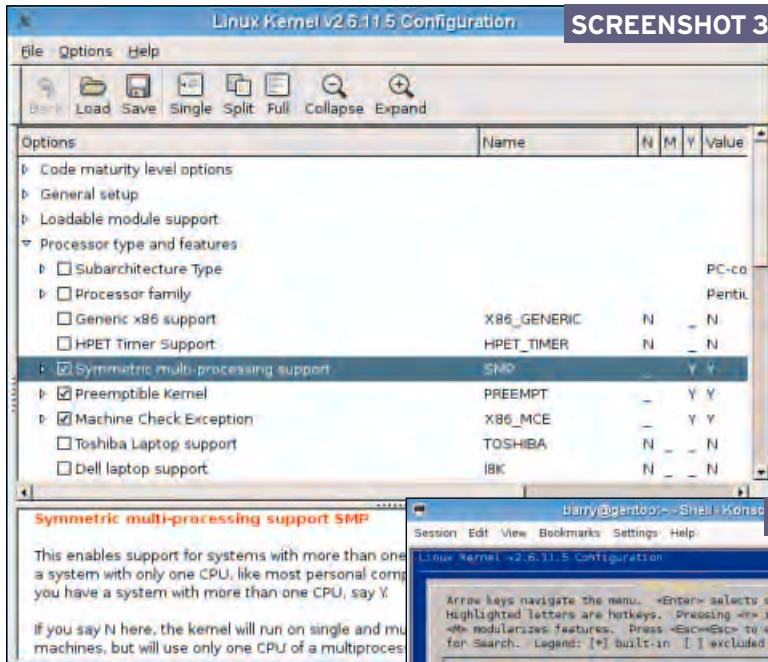
new kinds of hardware and new protocols and so on. The patch level changes more frequently and includes security updates and bug fixes, as well as minor enhancements such as improved hardware support. Kernel releases are usually known simply by their major and minor numbers – a 2.4 kernel or a 2.6 kernel, for example.

The minor number also described whether the kernel was a stable or development release. A stable kernel would be evenly numbered, a development kernel odd. When 2.4.0 was released, its even minor number indicates a stable kernel. Once the kernel had settled, let's say at 2.4.10, this version would become 2.5.0 and a new development branch would begin. Eventually, when the development kernel had become stable itself, perhaps at 2.5.72, it would become 2.6.0, and the whole process would start again.

With the release of the 2.6 kernel it became apparent things weren't going the same way. Unlike previous kernels, quite significant changes were going into the stable branch. Some fundamental parts of the infrastructure were being rewritten – something that had previously only happened in the development branch. The 2.6 kernel was released in February 2004 and a year on there was still no 2.7 branch, despite all of the major changes in the stable version. It was clear something needed to be done, so a new scheme was introduced with version 2.6.11.



The menu-driven interface to configure the kernel



Using a GUI interface to configure the kernel instead

After entering the directory, the patch is uncompressed with bzip2 and the patch program applies it to the source code. In screenshot 1 you can see the results of this action. As the code is no longer version 2.6.11, it makes sense to rename the directory to the new version.

Kernel configuration

The configuration is the most complicated part of building a new kernel, as it involves selecting which parts of the kernel you want to use. It helps to know a bit about your hardware – leaving out support for hardware you rely on is not a good idea. This is especially true for essential hardware like the hard drives. If you don't include IDE support, your kernel won't be able to access your IDE drives. Similarly, if you don't include ext3 filesystem support, the kernel won't be able to read your ext3 partitions.

There are three ways to configure the kernel. The oldest and least attractive way is to go through each option sequentially, which would be a painful process. The remaining two methods are to use a text-based menu system or a graphical interface. You can choose which to use by running the menuconfig or gconfig build scripts. Enter the source directory and try either way:

```
# cd /usr/src/linux-2.6.11.5
# make menuconfig
# make gconfig
```

Screenshots 2 and 3 show the two configuration screens. You can use whichever you're more comfortable with. The menu-driven screen will be faster to use, while the graphical version makes it easier to see what each option does.

Modules

Most code in the kernel can be compiled as modules. That means the kernel won't load the code until it's needed at runtime and it can be removed from the kernel when no longer required. The main benefit of this approach is that you can compile support for lots of things you don't often need or don't currently need, without making the kernel too large. Distributions must support all sorts of features to provide for the demands of any user, and will often include modules for every part of the kernel. The modules are stored on the disk as normal files and kept away from the kernel binary.

With the menu system, press 'm' to compile the option as a module, or 'y' to compile as part of the kernel. Pressing 'n' will prevent the option

A few ideas were suggested, but in the end it was decided to adopt a four number system. The fourth number release is known as the 'sucker tree', after Linus Torvalds suggested that nobody would want to maintain this tree. In this series, only essential bug fixes and security updates are applied, thus avoiding the more significant changes that are going in between the patch level releases. So the 2.6.11.1 kernel is identical to the 2.6.11 kernel, except for these important fixes. The numbering system is otherwise the same as before.

Kernel compilation

When you install a distribution it comes with a preconfigured kernel. It's rarely the same as the official kernel – what's known as a vanilla kernel – but will include various patches applied by the vendor. These patches might add extra support or may change the behaviour of the kernel. Distribution vendors will release updated kernels when necessary. These may involve a new version, or may just have the fixes and changes back-ported to the currently installed version. Either way, as a user, you rarely have to worry about such things.

A good way to learn a lot about Linux is to try installing a kernel yourself. It's not an easy thing to do but, provided you keep your old kernel around, you should still be able to fall back to that. Don't be surprised if things don't work as expected or if you can't even boot your new kernel. As with most things, once you get used to the process, you'll find it takes a lot less effort

and is relatively straightforward. The kernel build process involves a few stages: extract the source code and apply patches; configure the kernel; build the kernel and modules; install the kernel and modules and configure the boot loader.

The latest version of the kernel is available at www.kernel.org. A full download of the source code is currently about 36MB. To avoid having to download a full copy after every patch release, you can also download the patch alone. So, for instance, you can apply the 2.6.11.1 patch on top of the 2.6.11 release, downloading just a few kilobytes instead. If you've bought the DVD edition of PCW, you'll find the full kernel sources at the time of writing (2.6.11.5). Extract the source code in the usual way:

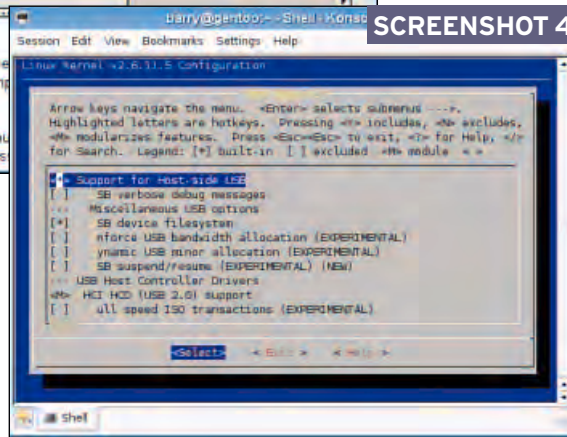
```
# cd /usr/src
# tar xfvj linux-2.6.11.5.tar.bz2
```

(Key: ✓ code string continues)

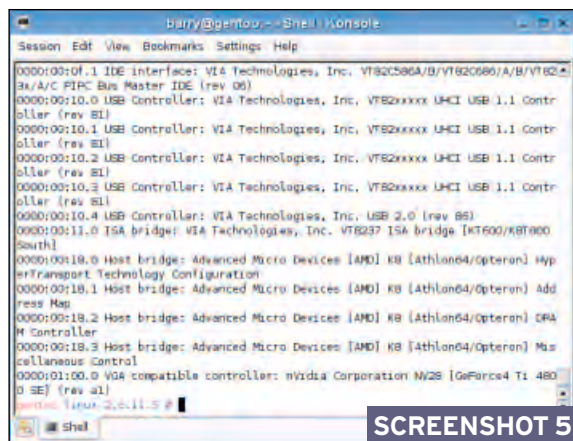
This creates a directory called linux-2.6.11.5 in /usr/src and extracts the source code there. To apply a patch, let's say on to 2.6.11, you would first extract the kernel code, and then do the following:

```
# cd /usr/src/linux-2.6.11
# bzip2 /tmp/patch-2.6.11.5.bz2 | patch -p1
```

A typical set of configuration options - here for USB



SCREENSHOT 4



SCREENSHOT 5

from being compiled at all. Any code that can be compiled as a module has angular brackets and code which must be compiled as part of the kernel has square brackets. In the graphical utility, click on the 'n', 'm' or 'y' column (see screenshot 4). This is a typical section of the configuration, which, in this case, is controlling the kernel support for USB. The first item has angular brackets, so can be compiled either as a module or built in as part of the kernel – the asterisk inside the brackets indicates it's compiled into the kernel. The USB device filesystem option has square brackets and can only be built in. USB 2 on the other hand has an 'M' inside its angular brackets, so will be compiled as a module.

Having to trawl through all of the possible options is overwhelming to begin with. Fortunately, the default configuration is fairly sane and includes support for the most common requirements. If you've changed lots of options and saved them, you can return to the defaults by running 'make defconfig' and then re-running 'make menuconfig' (or gconfig) as before. The options are broken up into categories: the top level has broad main categories, which are then divided into more specific areas. Under 'Processor Type and Features' you will find options for symmetric multi-processor (SMP) systems; under 'Power Management' there are sub-menus for ACPI, APM and CPU Frequency Scaling.

Certain parts of the kernel need attention if you're building from a default configuration. It's highly recommended to compile any code needed to read the disk as built in, rather than as modules. The reason is quite simple really – the kernel needs to be able to access the hard drive and read the filesystem to load any modules. If you compile the filesystem support as a module, the kernel is unable to access the filesystem to load

List all PCI devices on your computer with the lspci command

that module in the first place. There are ways around this, but it complicates the process further.

Select 'Device Drivers' and 'ATA/ATAPI support'. The default configuration has support compiled in just as we want. Further down the options is a list of chipset-specific ATA/IDE drivers. Without a driver for your IDE chipset, the kernel uses a generic driver, which will give considerably less performance. Since Linux runs on multiple platforms as well as fairly venerable PCs, there's support for many chipsets. Most people will use 'AMD and Nvidia IDE support', 'Intel PIIXn chipset support', or 'VIA82CXXX chipset support'.

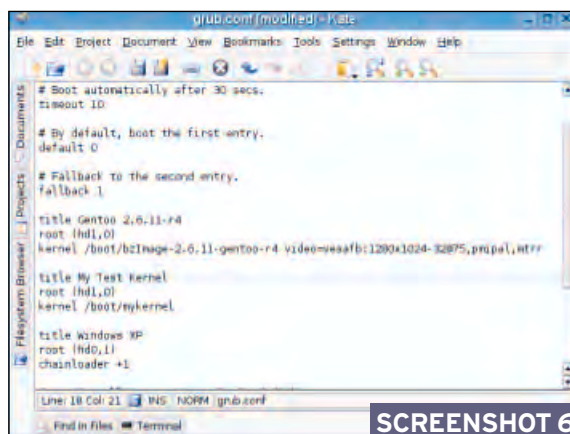
There's no problem compiling in all three, as the kernel will use whichever driver is appropriate. To find out what you have, you can use the 'lspci' command. This lists all the PCI devices on your computer. For example, run:

```
# lspci | grep IDE
```

In screenshot 5 you can see more output from the lspci command. At the top is an entry for the IDE controller – it makes it clear, in this case, that the VIA82CXXX driver is the one we need. The output from the lspci command may be helpful for other parts of the kernel configuration.

There are other parts worth concentrating on. In the SCSI section, you will need to enable any support for Serial ATA drives or SCSI hard drives you have. If you use Firewire devices, look at the IEEE 1394 (Firewire) section. For your graphics card, you have to find the appropriate AGP driver – this is found under Devices, Character Devices, AGP Support. For many 3D graphics card (excluding Nvidia), be sure to enable the correct Direct Rendering (DRI) option, found just below the AGP setting. Under USB you may have to enable more options. There are two kinds of USB1.1 specifications: OHCI and UHCI. A run of lspci will tell you which you have. You must then select

Add the new kernel image to Grub's configuration file



SCREENSHOT 6

any drivers for USB hardware you have, such as USB mass storage for flash drives or USB human interface for USB keyboards and mice. Under the Filesystem section it's important to include support for all filesystems you need to access – ext2, ext3, Reiserfs, ISO9660 (CD), UDF (DVD), Fat and NTFS are recommended. Under the Network Filesystem option you can add support for NFS, Samba, CIFS and others.

My earlier warning was not in jest – this process can be overwhelming. Most vendors include almost all options as modules to support as much as possible, but the default configuration, with a few specific areas you need, should be enough to get going. When the configuration's finished and saved, it's time to build the kernel.

Building and installing

The build process couldn't be simpler, just run one command:

```
# make
```

Depending on the amount of code you selected to compile and your computer's speed, this could take anything from five minutes to an hour. Each part of the kernel will be compiled and chug by on the screen as it goes. The final step is to install the kernel and modules. A make command installs the modules, while you must manually copy the kernel binary image to your boot directory:

```
# make modules_install
# cp arch/i386/boot/bzImage /boot/mykernel
```

The standard name for the kernel image is bzImage because it's compressed with bzip in order to keep the file size as low as possible. You can rename it to anything you like. The modules are copied to the /lib/modules directory, using the kernel's version, in this case being /lib/modules/2.6.11.5/.

Once installed, all that remains is to configure the bootloader. Most distributions use the Grub loader. Edit the file /boot/grub/grub.conf (sometimes menu.lst) and add an entry for the new kernel (see screenshot 6). Add a title for the Grub menu, a root directory for Grub's files (copied from the previous entry) and where to find the new kernel, and that's it.

Save the configuration file, reboot the system and cross your fingers. If it fails miserably, just boot your old kernel and try again.

CONTACTS

Barry Shilliday welcomes your comments on the Linux/Unix column. Email him at: linux@pcw.co.uk. Please do not send unsolicited file attachments.

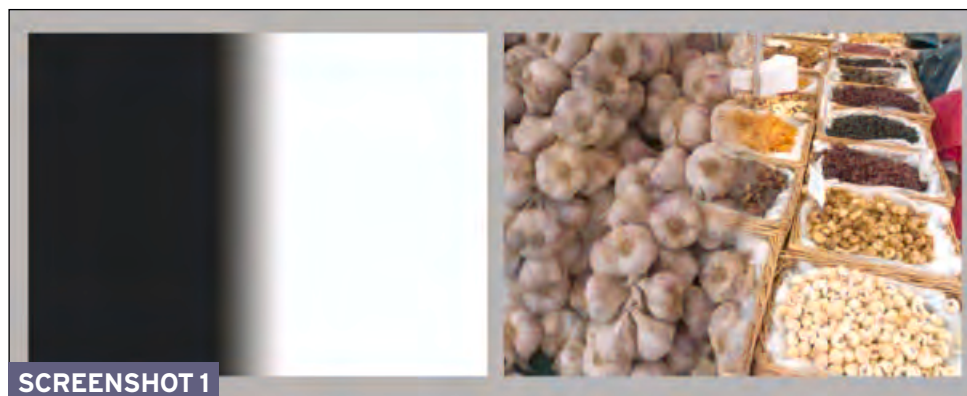


Ken McMahon

is a freelance journalist and graphic designer. His involvement with digital graphics began with a Commodore 64. He graduated to Macs and now works mostly with PCs. Draw your own conclusions

Spice up your transitions

How to use Spicemaster to create customised movie transitions



SCREENSHOT 1

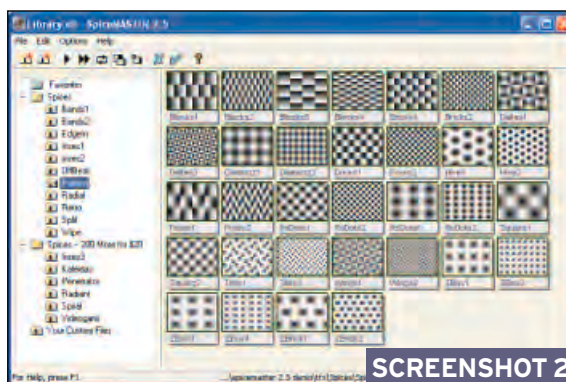
The purists will tell you that the only movie transition you need ever use is a straight cut – directly from one clip to the next with no messing about. But you can never have enough transitions. Like fonts, though, it's a good idea not to use too many at once (and, for some, not at all).

The problem with a lot of transitions is that they leave little scope for customisation and control and, in their out-of-the-box state, may not be what you had in mind. If you've exhausted the creative potential of your video-editing application's transitions, Pixelan Spicemaster could be the answer.

Spicemaster is a transitions and effects plug-in available for Adobe Premiere Pro and Elements, After Effects, (this version also works with Media 100/844/X, eyeon Digital Fusion and Boris RED), Avid, DPS Velocity, Pinnacle Liquid Edition, Sony Vegas and Ulead Video Studio (v6 and later) and Media Studio.

There are two versions of the plug-in – Spicemaster 2.5 TFX, which includes 400 transitions and the Pro version, which includes more than twice as many transitions and an advanced interface with additional control features. This includes a mixer, which can be used to create effect dissolves and blends and extra controls for softness, texture, borders, rotation and spin effects. You can download demo versions from www.pixelan.com.

Spicemaster's transitions work by using an image map to control the rate and shape of video transitions and effects. Each transition is based on an 8bit greyscale image – the so-called spices. Black pixels in the



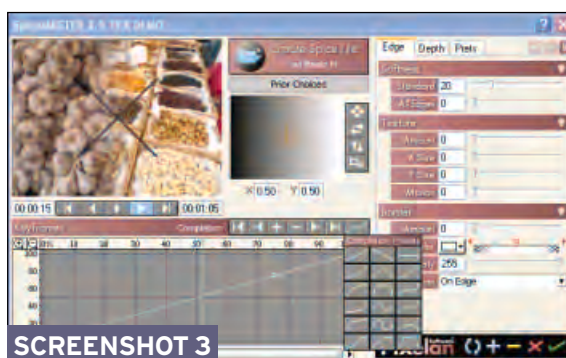
SCREENSHOT 2

Top: Spicemaster uses a greyscale map to drive its transitions and effects

Above: You can choose from hundreds of preset spice files as the starting point for an effect or transition

greyscale are the first to be revealed during a transition and white the last. Grey pixels appear somewhere in between, depending on their greyscale value.

Because the shape and rate of a Spicemaster transition is determined by the greyscale value of pixels, spices make frequent use of gradients. A linear gradient, for example, progressing from solid black on the left to white on the extreme right, would produce a left-to-right wipe. A radial gradient – that is, black in the centre progressing to white at the periphery – would produce an iris dissolve starting at the centre and moving out. Invert the greyscale spice



SCREENSHOT 3

file and the transition would reverse, starting at the outer edges and progressing inwards (see screenshot 1).

But these are basic transitions that you can find in any video editor. Things get interesting when you explore the folders of spices available within the Spicemaster plug-in.

All are basically an exercise in creative gradient art and, while some are quite predictable, others produce surprising results. Among the most interesting and difficult to predict are the patterned spices. These use gradients in a repeating pattern, rather than a single sweep across the entire frame and in the resulting transitions tiny islands of incoming clip appear, expand and then join up to complete the effect (see screenshot 2).

Used in this way, Spicemaster can produce as many transitions as there are spices. But the plug-in interface provides a number of ways to adapt the basic effect to produce new variations. The Spicemaster interface provides a preview window with playback controls, so you can see what's going on in real-time as you make changes. Basic positional and transformation controls allow you to move the effect around the frame, flip it, resize it or invert it – effectively changing the direction of the effect.

Of the three tabbed panels on the right of the interface, the one labelled Edge provides the most creative potential. The softness slider blurs boundary edges, the default setting of 20 introduces softness without losing too much shape definition, 0 produces crisply defined sharp edges. Texture adds noise to the boundary, and the size and motion sliders allow you to further distort the grain to produce a variety of edge effects, with appearances that range from light snow to acid rain.

Finally, the border controls allow you to add a border, define its width and colour, set its opacity and position it on the inside or outside edge of the transition boundary.

The Depth panel provides controls for adding drop-shadows and glows. You can add these effects to either clip in the transition, which means you can produce cut-out effects as well. As with all the other settings,

Left: The Spicemaster 2.5 interface provides keyframeable control of the effect over time with a number of presets


SCREENSHOT 4

Left: You can create your own custom spices in any image editor with a gradient tool

Below: The PCW spice in action

the Depth controls include a wide range of presets, which you can access from a pull-down menu and tweak, or create your own effect settings and save them as a preset for later single-click applications. The last of the three panels is for setting preferences.

Below the preview window, a keyframer provides control over the speed and progress of the transition. Scrubbing the playhead and adding and adjusting keyframes is as straightforward as it gets and there are 18 available presets, including one which reverses the transition. Keyframes have bezier handles, which makes adjusting the shape of the curve, say, to accelerate into or out of a transition, a simple task.

One disappointment here is that only the progression of the transition, not the individual settings, are keyframeable. You can't, for example, keyframe position or size, though to be fair, these parameters are more readily controlled within the greyscale spice file itself (see screenshot 3).

So, when you've experimented with every spice file, including the additional \$20 (£11 approx) set of 200, tried all the edge and depth presets and run out of ideas for creating your own, where do you turn to for fresh ideas? If you're anything like me, long before you get to this stage you'll have been contemplating the potential of creating your own spice files. This is quite straightforward and, although the Pixelan documentation doesn't go into any detail, the very fact that spice library contains a folder called 'Your custom files' is evidence this is an invitation to create.

I'll quickly run through how to do this in Photoshop, but you can use any image-editing program that has a graduated fill tool and can save 8bit greyscale files in one of the Spicemaster supported file types – bmp, jpg, png, tiff and tga. You'll find the Pixelan spices in a

subfolder of your video-editing application's folder. For Premiere Pro 1.5 it's at Premiere 1.5\Pixelan\spiceMASTER 2.5\TFX\Spices. Within this folder you'll find a subfolder called Your custom files, and this is where you need to save homemade spices.

To create a new spice file in Photoshop create a new file using the Pal D1/DV, 720 x 576 (with guides) preset. Before you click OK, change the Color Mode to Greyscale.

Now you need to create a greyscale map using the gradient tool. How you go about this depends, of course, on the nature of the transition you want to produce. One of the best sources of ideas is the existing collection of spices. These cover most of the obvious approaches and you'll probably want to produce something more original, based on new shapes, type or a logo for example.

To produce something that works, you'll need to make selections, which you can then fill using the Gradient tool. When planning the design of

The Spicemaster effect can be used to transition other effects using two overlaid copies of the same clip. The effect is applied to the lower clip and revealed using Spicemaster on the upper clip


SCREENSHOT 5

the map always bear in mind that gradients control time – try to visualise how a gradient will reveal the image in the transition or effect. Unless you want images to be revealed instantly, there should be no flat areas of white or black in the map (see screenshot 4).

In this example, I first used the Gradient tool to produce a simple linear gradient running from right to left to create a wipe. I then created a new type layer using a heavy font to produce the PCW type in black. I rasterised the type layer and locked its transparency. I then used the Gradient tool to fill the type with the same linear gradient running in the opposite direction to the background.

Screenshot 5 shows the transition just past the halfway point. The background gradient reveals the incoming image in a left-to-right wipe while, at the same time, the type gradient reveals it in the PCW type running from right to left. If you want the transition to run in the opposite direction (so the type is revealed from right to left, which, if you think about it, makes more sense) you can invert the spice file in Photoshop, use the Spicemaster keyframer or click the invert button.

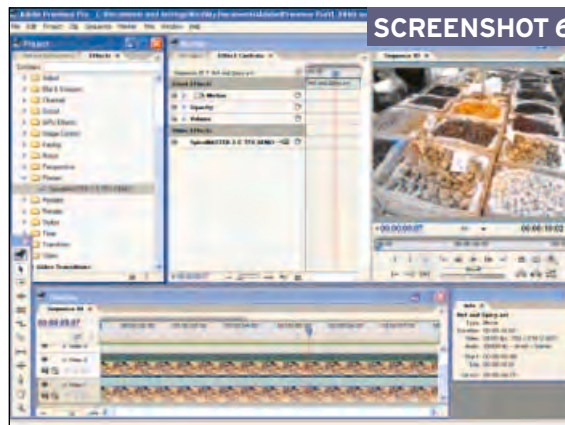
As well as providing hundreds of customisable transitions, you can use Spicemaster to add spice, to video effects. In screenshot 6 I've superimposed a copy of a clip directly above itself in the video 2 track. To the lower version of the clip I applied the black & white video filter.

To the upper clip, I applied the Spicemaster 2.5 effect using the default spice file and all the default settings, which produces a simple diamond iris effect, starting at the centre and working outwards to the full extent of the frame.

The effect of this is shown in black and white video, with colour gradually introduced, starting at the centre and gradually bleeding outwards to infuse the whole frame. This is a simple example, which takes a couple of seconds to set up, although the potential for extending video effects is huge. As well as adding a new dimension to your effects filters, you can use Spicemaster in a similar way to provide new animation and effects options for titling.

CONTACTS

Ken McMahon welcomes your comments on the Digital imaging & video column. Email him at: digitalimaging@pcw.co.uk. Please do not send unsolicited file attachments.


SCREENSHOT 6



Tim Nott

is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family

Saving your custom settings

Take the grief out of restoring Word's options with a simple macro

The Word Options dialogue has provided users with a rich vein of displacement activity for more than a decade. Each time I install a new version of Word, the Options dialogue is the first stop – turn off fast saves, set a sensible location for the custom dictionary, turn off the 'select whole word' annoyance, max out the number of recent documents in the file menu and so on.

What would be really useful would be a way of saving all these settings, so in the event that something went wrong you could restore them in a few clicks. This is, in fact, very simple and doesn't involve any Registry delving. The trick is to record a macro. Go to Tools, Macro, Record new macro and give it a suitable name, for example, MySettings. With the recorder running, go to Tools Options and tab through each page of the dialogue in turn. When you have tabbed through all the pages whose options you want to preserve, press the OK button to close the Options dialogue. Now stop recording by clicking the Stop button on the macro recorder toolbar. If you then examine your recorded macro, you'll see something like screenshot 1. Running the macro will restore all the saved settings.

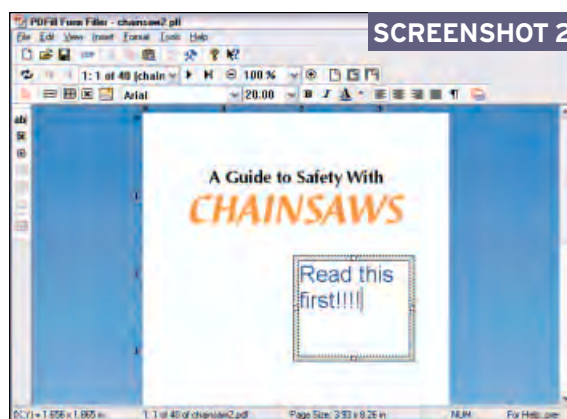
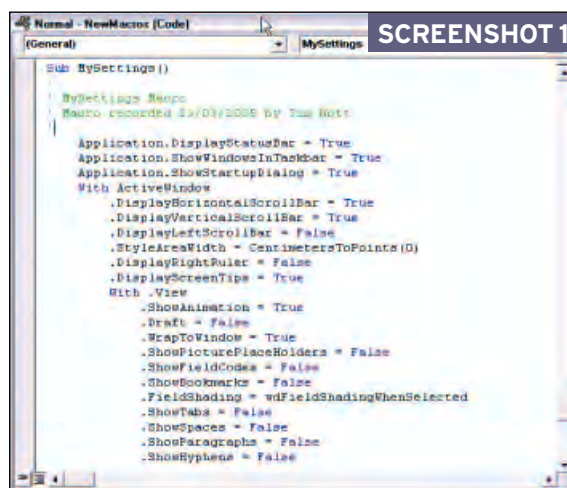
First-class degree

Further to Roger Castle-Smith's search for a degree and other symbols as Autocorrect entries, (see April PCW Question Time) he has solved the problem and been kind enough to share it with us.

To recap briefly, Roger wanted to have, for example, 25deg replaced automatically by 25°.

However, deg on its own, leaves a space between the number and the symbol and, unless you enter Autocorrect entries for 25deg, 26deg and every other temperature value you are going to use, Autocorrect won't recognise it.

We suggested using custom keyboard assignments, but Roger persevered and found that if a non-alphanumeric character started the sequence to replace, then this would work when typed straight after a numeric value. For example, if you set =deg to be replaced by the degree symbol, then typing 25=deg produces 25°.



Top: This macro will restore all your Options

Above: Annotating pdfs with PDFill Form Filler

Lost in space

Most word processors adjust the width of spaces to suit line length and so on – this is particularly noticeable with justified text. Sometimes an ordinary space won't do – you need something with a fixed width. Using a fixed-width font, such as Courier New won't help as the spaces will be stretched under certain circumstances.

Traditional (human) places would use fixed-width metal blocks. An em is a unit of type measurement, namely a square equal to the height of the letter M – this depends on the font and font size. An em-space is a space of this width and an en-space is half of that. There are also four-per-em and six-per-em spaces in the printer's type cases.

These characters have an assignment in the Unicode standard. An em-space is U+2003, an en-space is U+2002 and the four- and six-per-em are U+2005 and U+2006 respectively. So, in theory, you

should be able to get these in Word 2003 by typing 2003 followed by Alt&X. However, few fonts contain these characters. Word compensates for this by calculating the correct en- and em-spaces, and you can find these in Insert, Symbol, Special Characters in Word 97 and later.

Wordperfect users are unable to use Unicode spaces, as the application does not support the standard and there is no built-in algorithm for creating them. There is, however, a workaround. Go to <http://home.earthlink.net/~wptoolbox/OtherAuthors.html#lindsayrollo> and download a file named spaces.zip. This contains a Truetype font containing all the typographic spaces, an explanatory file in pdf format and a set of Wordperfect macros to assign the spaces to keystrokes. Author Lindsay Rollo has made this available free for personal use – business users will need to obtain a license from the author.

Egg on face

Further to May's comments on using PDF Filler Pilot to create 'fillable' forms from Adobe Acrobat documents, readers W M A King and Douglas Redfern pointed out that the Home version won't do this – you need to pay a lot more for the Office version. My apologies – the developer's and the reseller's websites were confusing here.

Douglas recommends PDFill Form Filler from www.plotssoft.com. This costs \$9.99 (approx £5.30) and is free to try if you don't mind watermarked adverts on your documents. It works in a different way to Filler Pilot – you open the pdf in PDFill Form Filler, add and format text and graphics, then save the project (see screenshot 2). It will then appear in Acrobat Reader, with your additions, ready for printing. You'll also need to download Ghostscript – this is free and PDFill Form Filler will find it for you when you first run the program.

Unfortunately, we couldn't get it to work with the Inland Revenue form – it asked us to repair the form in Acrobat Reader, after which we just got a blank document, but it did work with other pdfs.

CONTACTS

Tim Nott welcomes your comments on the Word processing column. Email him at: wp@pcw.co.uk. Please do not send unsolicited file attachments.



Balancing the books

Want to avoid problems with your accounts? Let Excel warn you when things don't add up

Excel offers a number of ways of warning you if your accounts don't balance. Here are four of them: you could use a formula; conditional formatting; display a Watch Window; or pop up a Message Box (see screenshot 1).

Let's say the total assets of your company's balance sheet are totalled in cell B9 and total liabilities are shown in M9 on an Excel worksheet. Select B9 and enter 'Assets' in the name box at the left of the Formula Bar. Similarly, name cell M9 'Liabilities'. If you press Ctrl & F3 the Define Name dialogue box will confirm the cells to which these two names now refer.

If cell C9 is empty, and you would like to have the warning there, format that cell for a bold, red font and enter the formula:

```
=IF(Assets<>Liabilities,"Doesn't balance","")
```

(Key: ✓ code string continues)

If cells B9 and M9 display the same amount, cell C9 will be blank. If they don't, then C9 will display 'Doesn't Balance' in red.

If you want to use conditional formatting, enter 'Doesn't balance' in cell B10 and format the font colour white (assuming the background is white). With cell B10 still having the focus, choose conditional formatting on the Format menu. Choose Formula Is in the first box. In the second box enter:

```
=Assets<>Liabilities
```

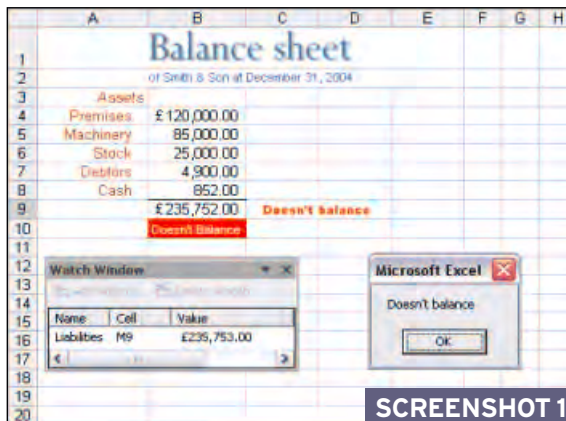
Click the Format button in that dialogue box and choose Patterns, then a red colour.

When cells B9 and M9 agree, cell B10 will be blank. When they don't, B10 will display: 'Doesn't Balance' in a white font on a red background.

In recent versions of Excel, you can choose a Watch Windows from the View/Toolbars menu. Click on cell M9 then click Add Watch in the Watch Window. You can now see what's displayed off the screen in cell M9 and compare it with cell B9.

Finally, you could use a Message Box. Right-click on the worksheet tab and choose View Code. In the right-hand panel enter:

```
Private Sub ✓
```



SCREENSHOT 1

```
Worksheet_Change(ByVal Target As Range)
If Range("Assets") <> Range("Liabilities") Then
MsgBox "Doesn't balance"
End If
End Sub
```

Four different ways of being warned if your accounts don't balance

Save the file and return to the worksheet. Now, when the assets in B9 don't agree with the liabilities in M9 a Message Box will pop up and say 'Doesn't balance'.

Up the family tree

If you're serious about studying your family history you'll want to get some genealogy software. But if you just need to keep track of your immediate kin for birthday cards or wedding invitations, a spreadsheet will do. Many spreadsheet publishers give you a helping hand by providing templates. Microsoft has one for Excel at <http://office.microsoft.com/en-gb/templates/default.aspx>

On that website, choose Hobbies and then Genealogy. I've changed the colour scheme and added some names to give an example, but otherwise screenshot 2 shows how the top half of this free Excel template looks. Once you perceive how Microsoft has formatted the cells

A portion of a free family tree template for Excel available from Microsoft



SCREENSHOT 2

and linking lines it is easy to adapt this worksheet to maintain a record of your own relatives.

Keep it to yourself

It's impossible to make Excel secure against a knowledgeable hacker, but you can make them stop and think, and you can hide a lot from average users. One way is by limiting scrolling. Let's say you have a worksheet with data in rows 1 to 39 and columns A to P. The immediate visible range is A1: L23 and you can scroll to see cell P39. But you would rather users couldn't scroll past row 30 and column N.

One solution is to hide rows 31 to 39 and columns O and P. Click on the row number for row 31 and press Ctrl & Shift & Down Arrow. This greys out rows 31 to 39. Press Ctrl & Shift & Down Arrow again and all the rows down 65536 are also greyed out. Immediately choose Rows, Hide on the Format menu and those rows disappear.

To conceal columns, click on the heading letter of column O and press Ctrl & Shift & Right Arrow twice. With columns O to IV selected choose Columns, Hide on the Format menu and those columns become invisible. At this point if you press Ctrl & Home the focus will shift to cell A1 and if you press Ctrl & End you will be at cell N30 not P39.

If you want to redisplay columns O and P, press Ctrl & A to select all the worksheet and then choose Columns, Unhide on the Format menu. To show rows 31 to 39 again, choose Rows, Unhide.

Another way of stopping scrolling, is with a short macro. Right-click on the worksheet tab and choose View Code. In the right-hand panel enter:

```
Private Sub ✓
Worksheet_SelectionChange ✓
(ByVal Target As Range)
Me.ScrollArea = "A1:M29"
End Sub
```

Return to the worksheet and press Ctrl & A. This macro will restrict scrolling beyond column N and row 30. Remove the macro to remove the restriction.

CONTACTS

Stephen Wells welcomes your comments on the Spreadsheets column. Email him at: spreadsheets@pcw.co.uk. Please do not send unsolicited file attachments.



Nigel Whitfield
edited computer magazines before going freelance in 1995. A specialist in Internet and consumer issues, he has a degree in Computing Science from Imperial College

Building a community

Add a forum to your site and planning ahead with CSS

Over the past couple of months, we've looked at using CSS to create styles and though the examples we've given have been fairly straightforward, they should give you a good grasp of how things work and make it easier to understand the options you'll find when you work with CSS in an application like Dreamweaver.

When you're setting up a site using CSS, it's a good idea to do a little planning ahead and think how you'll be using your styles, otherwise you could end up spending much more time later.

As a case in point – for a site I've recently built, a basic style sheet was put together, with entries for matters like headlines, section headings, item headings and so on. When it came to forms on the site that needed headings next to the data entry boxes, the logical choice was the item headings style. It helped maintain a consistent look across the site, but it came back to bite me later.

The reason? After some feedback from the beta testers, a left margin was added, so that text didn't butt up against the left-side of a browser window. You might think that is fairly straightforward. And it would be, but for the fact that simply adding a margin to all the CSS styles would do the same wherever a style was used, making the headings on some of the forms look a little odd.

So, the solution was to duplicate the appropriate style – before adding the margin to it – and call the new duplicate something useful like 'formItemHeading'. Then, amend the original item heading style to add the margin and, finally, go through the entire site changing headings in forms to the new style.

It's tedious work and something that could have been avoided had I done the thing that I'm always urging other people to do – plan, plan and plan. Even if you first imagine that two types of element on your page – in my case item headings, and form box headings – will look the same, remember that they are separate items and, though it might feel tedious at the time, create a separate CSS style for each type of item. It will save you a lot of time if you need



SCREENSHOT 1

to make changes to the style sheet later. You'll just need to alter the style sheet – which is best saved as a separate file, rather than included in each document, for large sites – instead of having to manually edit every page and reassign styles later. It's far better to end up with a few extra styles in your style sheet than to have too few. The amount of data in a style sheet is trivial, so it's really not going to make any difference to the download time of your site.

Attracting visitors

One of the things that most web designers would like is for their site to be visited by lots of people. You can promote it – but not by using junk mail – and mention it elsewhere on the Internet, put it in your email signature and arrange reciprocal links with similar sites. But none of that is much use unless there's a compelling reason for people to keep coming back.

So, how do you tackle that sort of thing? It was one of the issues facing the site on which I had my style sheet tribulations. It's a site that's intended to be a resource for users of a digital video recorder, which can be enhanced via software downloads. But a site that simply lists things you can download isn't terribly exciting, so we needed something to try and draw people back.

The obvious answer to that is forums. Discussion forums can help

provide a community and draw people back to your site to see the answers to questions they've posed. Obviously, they're not relevant to every site, but for the site in question, it seemed a logical idea. And one that immediately raises the question – how do I add a forum?

There are several packages that you can use to provide forums. In some cases, the type of forum that you can install will depend on your web host. Two of the most popular and well known are phpBB and YaBB. The former is actually a component of the PHP Nuke (www.phpnuke.org) open source portal system, though you can install it separately, if you don't want all the other portal functions (see screenshot 1).

As you can guess from the name, you need PHP on your web server to run phpBB. You'll also need the MySQL database, which is used as the back-end of the system – don't worry if you don't have the two on the main part of your site. If you have a site like www.nigelwhitfield.com, it won't look odd if you use a separate site like forum.nigelwhitfield.com to host your discussions, but obviously you'll also need to be able to manage the DNS entries to set that up.

YaBB is written in Perl, which is also a very popular scripting language and available on many web servers (see screenshot 2). Rather than use a database, it stores its information in text files, so all you need is the ability to run Perl scripts on your web host, rather than PHP scripting, MySQL and full access to a database. On the downside, the file structure might store

The PHP Nuke portal system includes a forum, called phpBB, which can also be installed on its own

The YaBB forum software is free and, being written in Perl, will run on a number of web hosting services



SCREENSHOT 2



SCREENSHOT 3

up problems for the future if you're running a very busy site.

In the end, though, we went with YaBB (www.yabbforum.com), which is very easy to set up. It's a simple matter of downloading a zip file, unpacking it and then uploading the files to your web server. You need to edit the Settings.pl file to tell the scripts where your files are stored, both in terms of the URL and of the directory on the server, and then make sure the script is set so that it can be executed. Then log in to the web page with the default admin user name and password, and fill in a few simple web forms to set up your forums. It really is extremely easy to do.

If you want to tweak the design a little, for instance, to match the colour scheme of your website, it's easy – just click on the Admin link, and you can alter the template file, with its CSS definitions from within your browser (see screenshot 3). That really is just about all it took – certainly less than half an hour. Even if you're not familiar with Perl, it's not exactly difficult to edit the settings file and get up and running. If you want a forum on your site, it's well worth taking a look at.

A forum isn't necessarily the only thing that you'll need. On the site I was setting up, we decided that it would be a good idea to have a function that allowed users to build up a personal page with information and quick links to the things they want to download. It's a handy tool that might help bring people back – especially since you can then email people when a new version of a product in their list appears, providing you seek their consent.

You can customise colours and other parts of the YaBB template from within your browser

when that's set. In the case of YaBB, the default cookie is called YaBBUsername, though you can change it if you like.

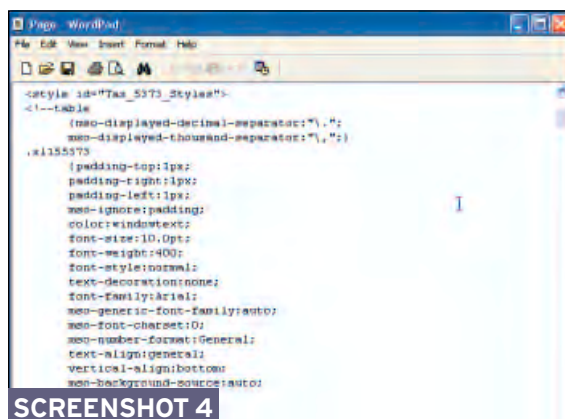
You can check for the presence of the cookie with some PHP code like this, which, if before the HTML section of a document, will redirect to the forum home page if the cookie is not there.

```
<?php
if ( ! isset($HTTP_COOKIE_
_VARS['YaBBUsername']) ) {
    header('Location:
www.mysite.com/cgi-
bin/yabb/YaBB.cgi');
    exit ;
}
```

(Key: ✓ code string continues)

You may want to redirect to a different page, explaining why people need to sign into the forums. Linking functions of the site like this can help to encourage people to sign up, since there's a tangible benefit to doing so. But don't do it just for the sake of it – think of how people might want to use your site and work around that. Pointlessly restricting

When Excel saves documents as web pages, CSS styles are used to control the way they appear



SCREENSHOT 4

And to help tie it in with the forums, and give an incentive to register, the functions restricted only to those who have signed up for the forums. That might sound complicated, but it's a lot simpler to do than you might imagine. All you do is check for the cookie that's set when a user logs in to the forums, and only allow the personalisation scripts to run

functions or sections of your site is likely to turn people away, rather than encourage them.

Reader queries

David Boswell asks: 'is it possible to reduce the size of an Excel spreadsheet saved as a web page, other than by printing out, scanning and reducing it as an object? Printing out in Excel does not reproduce the macro buttons and I also need the very best definition I can get. Using the zoom factor on the spreadsheet before saving it as a web page does not seem to work.'

The answer is, sort of. When you save a web page as Excel, either on a Mac or PC, what's created – unless you use embedded objects in Windows – is simply an HTML table, with formulas changed to the results they use (see screenshot 4). (Actually, strictly speaking, the formulas are still there, in XML, so the spreadsheet could be recreated from the HTML file).

At the top of the file, you'll find an embedded stylesheet. You can edit that – you could set up a global search and replace if you do this often – to alter the options, including font sizes, so that you end up with the desired effect. If you have the last two Web Development columns, you can now marvel at the forethought of including a crash course on CSS in them.

Alternatively, depending on the browser you're using, you have a few different options. In Internet Explorer, the View/Text Size menu options won't work because there are sizes specified in the document. But if you choose Accessibility from the Internet Options, you can override text sizes and styles in the document, which will then allow the menu options to increase or decrease text size to work. You could even create your own style sheet to apply, though that would only be worth the effort if you used an almost identical spreadsheet template a lot.

If you're using Opera, you can zoom in and out of a page, regardless of the style sheet that's been applied, so you can easily fit more of a spreadsheet into the Windows. And you can also click the drop-down view mode menu at the right to switch to User mode, which will use your own default styles, instead of the ones specified in the file.

CONTACTS

Hands on Web development will return in the September issue. Nigel Whitfield welcomes your comments on the Web development column. Email him at: webdev@pcw.co.uk. Please do not send unsolicited file attachments.



Tame your troublesome network

Painless network troubleshooting with the free Windows perfmon tool

Troubleshooting network problems is far from easy, even on a small home network and all the more so when you're looking for performance bottlenecks, rather than just tracking down broken or wrongly configured kit. However, there are utilities and tools to help, including the Performance Monitor (perfmon) tool bundled with every copy of 32bit Windows, from NT onwards.

Sometimes also referred to as the System Monitor, or the Performance tool in XP, perfmon is Microsoft Management Console (MMC) snap-in, which can be used to monitor performance in real time and capture historical data for more detailed offline analysis (see screenshot 1). It can be used locally, to see how the host PC is performing or, better still, remotely, to monitor activity on other desktops or servers without having to be sat in front of the actual hardware.

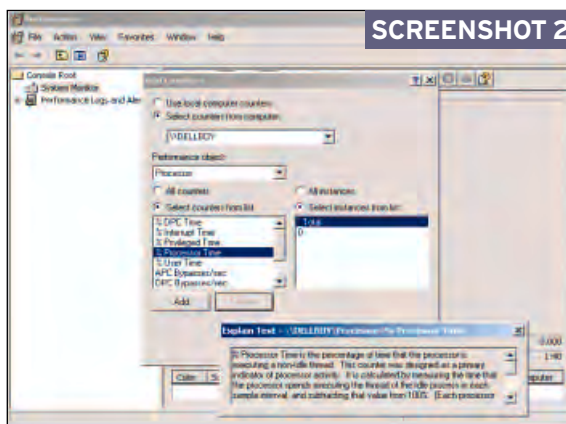
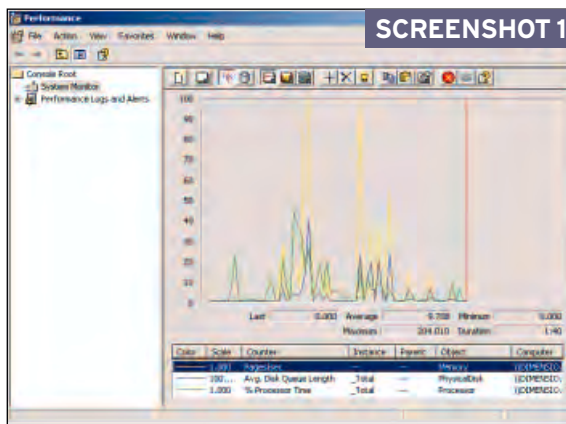
Getting started

The perfmon tool can be started in a number of ways, one of which is to type 'perfmon' in either a command window or the Start/Run menu. Another way is via the Administrative Tools applet in XP's Control Panel.

Whatever the approach, the end result is the same – an on-screen graph which displays the results extracted from a set of performance counters in real-time. These counters, in turn, get their data from so-called performance objects built into the operating system, with objects for the processor, network interface, the disk and so on all provided as standard.

What you get will depend on the system being monitored, with additional objects in different versions of Windows and even more when you install optional components or add-on applications. On servers, for example, you'll have objects for the SMTP, FTP, Active Server Pages and IIS services, together with objects for the .Net framework where installed.

There may be several counters associated with each object. For example, the network interface object has separate counters for packets sent and packets received. There may also be more than one instance of a counter, for example, where a server has more than one



processor or network interface. There's usually also a counter to automatically total all of the other instances together (_Total).

All this might sound a little complicated, but it's rare that you'll need to use more than a few objects or counters at a time. In practice, the perfmon tool is very easy to setup and use. It's something that's best illustrated with a practical example.

Practical monitoring

For this example, I'm running perfmon on a Windows XP Pro PC. With XP, the perfmon tool usually starts with a default set showing processor, memory and disk activity on the local system. If you don't want these on the graph they can be deleted (I've removed them in the screenshots) and new counters of your own choosing added.

This is done by either clicking the 'Add' button on the graph toolbar or by right-clicking on the graph and selecting Add Counters from the pop-up context menu. Either way, an Add Counters dialogue box is then

Top: On an XP system, the perfmon tool (referred to as Performance on this version of Windows) starts with a default set of counters already configured

Above: As well as the local PC, you can use perfmon to monitor remote desktops and servers. Here I've chosen the processor object on a remote Windows 2000 server

displayed where you first choose the remote computer to be monitored, if not the local system, and the performance object from which data is to be collected.

You'll need administrator privileges on the target system to monitor it, and when selecting a remote system you have to type in the name using standard UNC (Universal Naming Convention) notation – typically along the lines of \\servername. It's also possible to monitor counters/objects on more than one remote system together on the same graph.

You then select the performance object from a drop-down list, which can be a little daunting. However, explanatory notes for each can be displayed by clicking on 'Explain'.

In screenshot 2, I've selected the processor object on a remote server (\\DELLBOY), which has a number of associated counters that can be monitored and, if there's more than one processor, a choice of instances. I've chosen the counter %Processor Time – a primary indicator of CPU activity. There's only one processor on this server (instance 0), but if there were more, the _Total instance I've selected would total the activity on all of them.

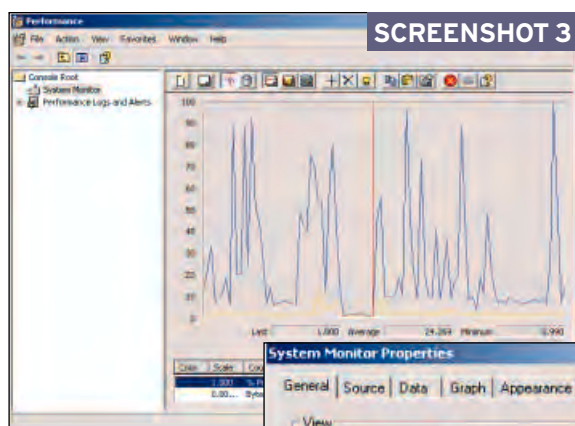
Clicking the Add button causes the counter to be included in the graph, the perfmon tool moving the timeline indicator (the long red line) from left to right as it goes. Any changes are then reflected as they happen – so open a document or file on the server, connect to web server, or whatever, and the graph rises as the processor goes to work then drops down once the transaction is complete.

Of course, more than one object/counter can be monitored at the same time and the Add Counters dialogue will still be open, so I can choose to monitor the network interface at the same time. This object has a number of associated counters and here I've chosen Bytes Total/sec to get an overall view of how much traffic is being handled by the network card on the server.

The end result will be a graph like that in screenshot 3, which shows the processor on this single CPU server working quite hard even though there's not much network activity.

If I was troubleshooting performance on this server, I could





Top: The processor on this single CPU server is working quite hard, but there's not that much activity on its network interface

then rule out the network interface and look at upgrading the basic processor/memory configuration instead.

A different display

By default, perfmon will start by plotting a line graph in its display area, but that can be changed by right-clicking anywhere on the graph and choosing Properties from the associated menu. You can then opt for a histogram, or continuously updated report (see screenshot 4), plus it's possible to fine tune a number of other display parameters.

For example, if you don't like the colour used to represent a counter, click on the Data tab and you can choose your own. If the scale isn't fine enough, click on the Graph tab and change it, add grid lines and so on to get it just the way you want.

Advanced monitoring

It's possible to gather a lot of useful information using perfmon, which can then be used to track down and eliminate possible bottlenecks. However, real-time monitoring can only go so far, so the perfmon tool also lets you log data to disk, so you can analyse the results of the historical information offline, with two types of log available – Counter and Trace.

Counter logs are the simplest to use, enabling you to do the same kind of monitoring I've just outlined, using the same performance objects and counters as in the real-time display. However, instead of graphing the data on the screen, it's stored in a log file. It's also possible to schedule

the collection rather than run it immediately, with no need for a user to be logged onto the system doing the monitoring.

Again, a quick example will help here, monitoring the same processor and network objects as before. To set this up, click on Performance Logs and Alerts in the left-hand pane of the perfmon display, select Counter Logs, then right-click in the window alongside and select New Log Settings

from the context menu supplying a unique name for identification (Network_1 in my example). Then add counters just as before, then decide how to store the data, what to call the log file, and when to start and stop the collection.

What you do here will depend on what you're monitoring. For instance, you might

want to collect data when a system was most heavily used and compare that with out-of-hours data. You can also opt to run an external command on completion, to email the results to whoever will be doing the analysis.

There are a number of ways in which logged data can be viewed. I've chosen to create a binary file, which can be opened using the perfmon tool and graphed as though it were a real-time collection. Equally, you can opt to create a csv file for use with Excel or another application.

Some limitations

There are some drawbacks to counter logs, not least of which is the fact that data isn't collected in a continuous stream. Rather, it's sampled at preset intervals, which helps reduce the overhead of monitoring itself and keeps the

log files down to a manageable size. The trouble is that this sampling approach averages the data collected and those users wanting more precise information may prefer to use either trace logs or the event tracing facility.

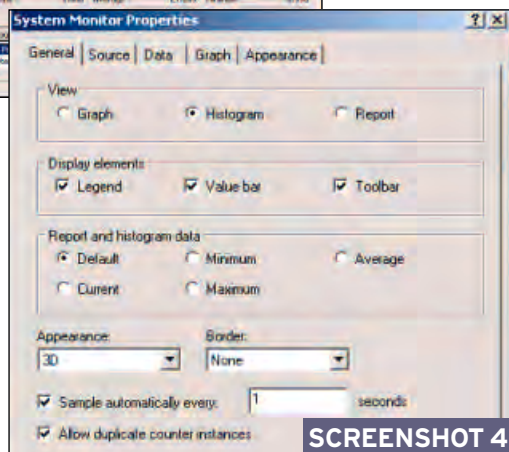
Trace logs are configured in much the same way as counter logs, but instead of performance objects and counters, special 'providers' are used to collect data when events being monitored occur.

The Windows kernel trace provider should always be available and this can be used to monitor events such as process creations/deletions, disk I/O, page faults and other common indicators. It can also be scheduled like a counter log, but the results can't be viewed using perfmon itself. A special tool is needed to interpret the data, such as tracedmp.exe, included as part of the Windows 2000 Resource Kit, which can be used to convert trace log files to .csv format.

Last, the Performance Logs and Alerts service allows performance objects/counters to be monitored and an alert issued when a preset threshold is passed. For example, you might want to know when processor utilisation rises above a certain level, or when network activity gets beyond acceptable limits.

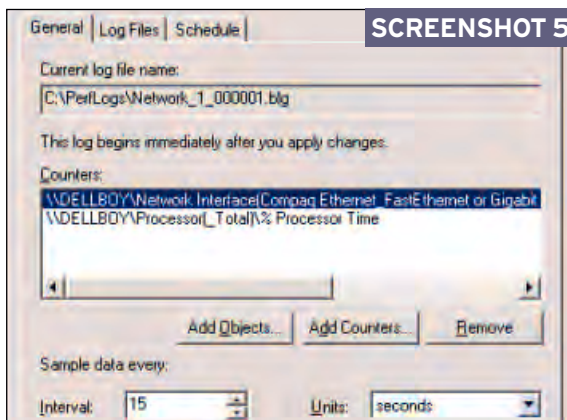
Alerts are, again, configured from the perfmon tool by selecting the performance object and counters to monitor. In addition, it's possible to specify a threshold value for each counter configured, and the action to take when the threshold is passed. An alert can be issued when the counter either goes above or below the value specified, and the actions that can be taken include logging to the event log, sending a network message, starting a performance log session and running an external command.

It's a lot to get to grips with and we've only covered the basics of the perfmon tool here. There's enough to point you in the right direction, but you will need to spend a while experimenting with the various options before using utilities like this in anger. Moreover, it's also important to know what's normal when interpreting the data, so spend some time establishing baselines – using well-configured hardware – before making any changes or upgrade decisions based on the data collected.



Above: The way data is graphed by perfmon can be customised with facilities to show a bar chart or continuously updated report

Below: As well as monitoring performance in real time, you can configure the perfmon tool to log data to a file for later analysis



CONTACTS

Alan Stevens welcomes your comments on the Networks column. Email him at: networks@pcw.co.uk. Please do not send unsolicited file attachments.



If it's not on the list, it's not coming in

How some Access design flaws can result in odd table behaviour

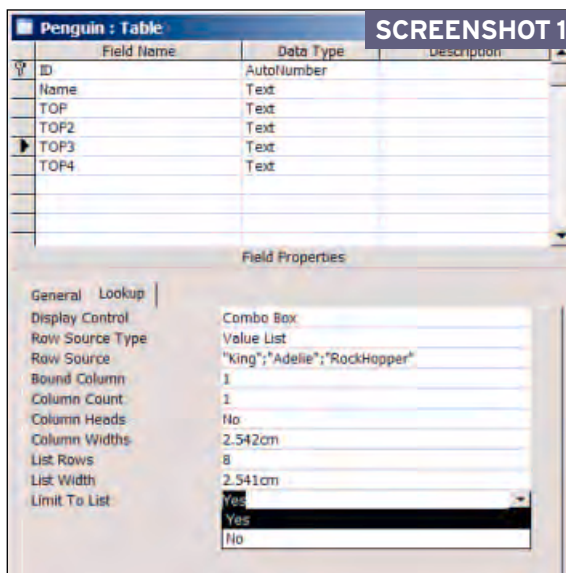
Reader Steve Ferry contacted me about some strangely aberrant table behaviour in Access 2000. He has a table with a text field, built with the Lookup wizard, that can contain one of three text strings – small, medium and large. He was quite clear that these were the only viable options, so he selected the 'Limit to List' option. He built a couple of forms based on the table and entered some data. However, when he queried the data, he got strange results and a little investigation revealed that the field held a mix of words and numbers (see table one).

His first thought was that Limit to List wasn't working, but he found that it was, at least in the sense that it wouldn't allow him to enter any numbers into the field. As he says: 'Limit to List stops me from entering numbers, but isn't stopping someone, somewhere from sneaking them in! How do I stop this?'

In order to explain what is happening here, we need to step back slightly and understand how several different Access components are working together. So, we'll build up a simplified version of Steve's database and look at each component in turn.

There's a tiny table called Penguin in the sample database file, DBC\Jul05.mdb, if you've bought the DVD edition of PCW or from www.penguinsoft.co.uk. This has a text field called TypeOfPenguin. There are no restrictions on this, so you can enter any text into the field.

A second field, TOP2, was built using the data type Lookup. Selecting this data type causes a wizard to run. I chose to 'type in the values I want' and supplied King, Adelie and



Setting the 'Limit to List' property for the TOP3 field

RockHopper. This created a Text field, as before, but the difference is that a combo box appears, which offers me my three options. However, I can still enter other information by hand if I so wish.

The third field, TOP3, is the same as TOP2 except that I have set the 'Limit to List' property to 'Yes', which means that I can only enter one of the values that appears in the combo box (see screenshot 1).

So we now have three slightly different fields to play with: Text

Text with Lookup

Text with Lookup and limited to list
Try them out. On the face of it, the fields behave as you would expect – the third (which is the same as Steve's) is the only one that restricts what you can enter. So it looks as if the 'Limit to List' is working. But all is not what it seems. For example, click in TOP3 to highlight that column and press Ctrl & C (for copy) and then click in TOP2 to highlight that column and press Ctrl & V (for paste). That pastes in all the values from TOP2, including those that are not on the list (see screenshot 2). So now it looks as if 'Limit to List' isn't working.

The trick is to realise that, despite appearances, 'Limit to List' isn't a property of the field, it's a property of the combo box that the Lookup wizard generated. If you check, you'll find that this property only appears when the combo box is added.

So, think of the situation like this. All three of these fields are actually text fields. The last two have combo boxes that sit on top of them; the second combo box is limited to list.

When Access shows us the data in a table – if there is a combo box defined in the Lookup tab – then this is automatically applied to the table view of the data (and, indeed, to any forms that we subsequently build on the table). So, when we try to enter data into the field, we are actually entering that data through the combo box and so the limit to list is applied. However, if we cut and paste the data as described above, that data is not going through the combo box and so the limit to list is not applied.

Now we can introduce another part of Steve's puzzle: where are his numbers coming from? Well, it turned out that one of the forms he had provided for his users had an Option Group. Option groups are weird because, by default, they let you select a word, but actually enter a number into the underlying field. We can duplicate this in our test database relatively easily.

Create a new form based on the table Penguin (an AutoForm is fine), flip into design mode and create an option group by using the Option Group tool from the toolbox and then following the Wizard. You need to type in the three options you want to appear (King, Adelie and RockHopper), but you'll notice that the wizard is assigning a number to each of these. Then tell the wizard into which field the values should be stored, in this case TOP3.

Once you have done this, your form will have two controls, which show the data in TOP3 (see screenshot 3).

One is a combo box, which shows the three options – King, Adelie and

Pasting data gets around the restriction of the 'Limit to List'

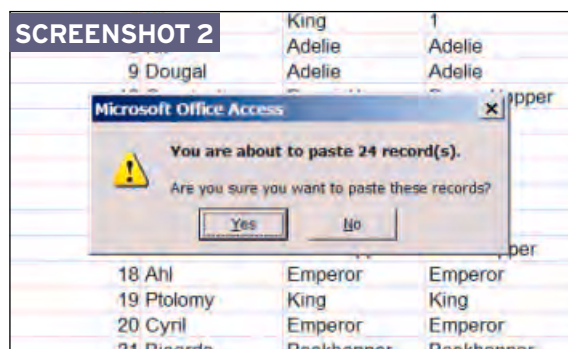
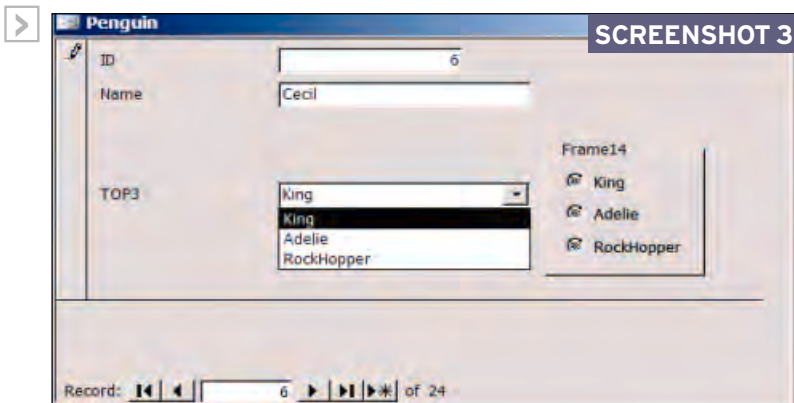


TABLE 1

ID	SIZE
1	Small
2	Medium
3	1
4	2
5	Large
6	Small
7	2
8	Medium



SCREENSHOT 3

RockHopper. This is limited to list, so these three options are the only ones that can go into the field via the combo box.

The second is the option group. When you choose any of the options, the option group inserts the number into the field – so in my case, if I choose 'King', the option group inserts the numerical value 1 into the field. Since this value isn't being passed through the combo box, no checking is applied to see if it is a member of that original list.

The bottom line is that you end up with a mixture of words and numbers in a field that, on the face of it, was set to be limited to a list of agreed values. And that is exactly what happened to Steve.

Making sense of it

Observant readers will have noticed that I have tried to explain this without passing comment on the fact that Access allows us to get into this bizarre state. But, if asked for an opinion, I'd say that this is an example of really poor thinking on the part of the Access design team, on at least two counts.

The first is the really fundamental error of mixing up the data structure and the UI. Back when the relational model was first designed, Ted Codd made it quite clear that we need to keep the two separate. Tables are simply two dimensional structures that hold data. It is perfectly appropriate to associate data integrity mechanisms (processes that help to improve data quality) with the table. For example, in Access we can ensure that only the text values we want to appear in a given text field by using a Validation rule (see screenshot 4). This definition becomes part of the field itself and cannot later be subverted by the UI.

By introducing the Lookup 'datatype' into Access, the developers of the product have added a UI component into the table structure. This is bad. By then allowing us to attach a data integrity

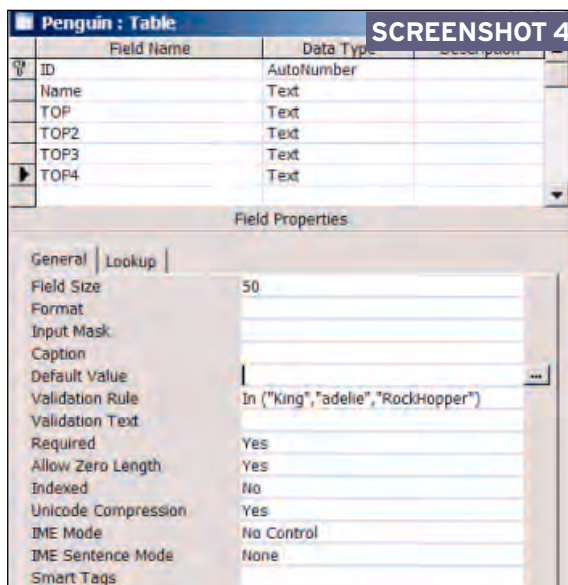
Two controls that add very different data to the same field

default view of the table. In other words, as soon as you simply open up the table to see the contents, the combo box appears. So most of the time, the data integrity is applied, but sometimes it isn't, which is rather confusing.

Next, they designed the Option Group so that, despite the fact that users choose text values (King, Adelie and so on), the Option Group actually writes numbers to the underlying text field. So, the UI shows you words, but, when you come to query the table, you find numbers.

What is so bizarre is that when Access was first released it didn't have these problems. It was a much simpler product, but it had a cohesion, which meant that all of the bits worked well together. Over the years, some excellent features have been added, which have really enhanced the product. However, more recently, developers within Microsoft seem to have been fiddling with the product without having a clear understanding of the fundamental rules that govern relational databases. Adding a UI component into a table is a clear case in point. It produces no real gain and,

Using a validation rule to control data entry into a field



SCREENSHOT 4

component (Limit to List) to that UI component, they have compounded the problem. We now have a property that looks as if it applies to the field, but actually applies to the UI component. Worse, the designers have ensured that the combo box appears in the

as this case illustrates, it adds pain. Access is a fine RDBMS, guys, please don't break it.

Linking addresses

In the past few months there has been some discussion about concatenating addresses without blank lines. Norman Krangel came up with a great solution in Lotus Approach.

He has five address fields – A1, A2, A3, A4 and PC. He created six new calculated fields, the first five, NEWA1, NEWA2, NEWA3, NEWA4 and NEWPC, fill the fields with either a blank entry or the address line details, plus a carriage return, that is:

```
IF (A1='', '', COMBINE
(A1, CHR(13)))
```

(Key: ✓ code string continues)

Approach uses a single ' for text and what you see here are pairs of single quotes with no space in between. The sixth calculated field combines all the new address fields:

```
COMBINE(NEWA1, NEWA2,
NEWA3, NEWA4, NEWPC)
```

Data visualisation

For centuries, people have been trying to find easy ways to visualise complex data. Both Edward Tufte (www.edwardtufte.com) and William Cleveland

(<http://cm.belllabs.com/cm/ms/departments/sia/wsc/>) have been thinking and writing about ways and means. What has surprised me is that the computer world has apparently turned a blind eye to all of this fundamental work and continued to give us a mundane and predictable diet of bar charts, pie charts and so on, with which to display our data.

The good news is that a company called Tableau Software is about to release a new product that incorporates a host of new visualisation techniques. It is well worth checking out the website (www.tableausoftware.com) to get a taste for what its product can do. The company bills itself as 'Visual Thinking for Business Intelligence', which I like, but it also implies that the software could only be used on large-scale, enterprise-level projects. However, it turns out that the new product has hooks that allow it to pull data from 'normal' database platforms, such as SQL Server, Access and even flat files. So the hooks are there, we just have to wait for the price.

CONTACTS

Mark Whitehorn welcomes your comments on the Databases column. Email him at: database@pcw.co.uk. Please do not send unsolicited file attachments.

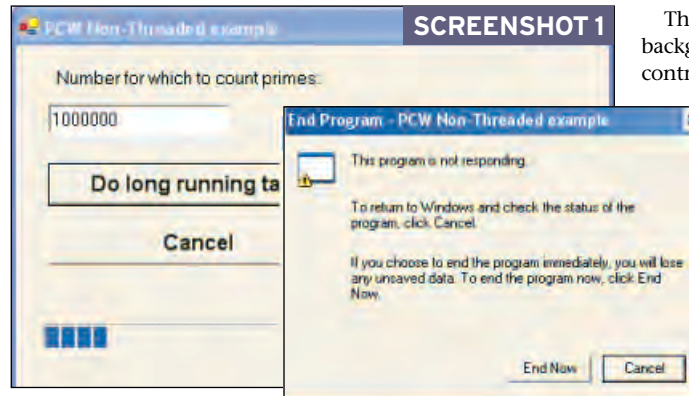


Unravelling the threads

There is great advantage in writing multi-threaded applications in Visual Basic

It's always annoying when an application is unresponsive. The application's busy, but pressing Escape or Cancel does nothing and you have no idea how long it will be before you regain control. For all you know, the application might have crashed or be in an infinite loop. Users will be tempted to fire up Task Manager and kill the process (see screenshot 1). Any application can present this kind of unresponsive user interface during a long operation, unless the programmer tries to prevent it. By default, the code you write in a Visual Basic or Visual Basic .Net application runs on a single thread, although the application may have other threads which are not under your control and long-running procedures in single-threaded applications are bad news.

The responsiveness of the user interface also has a big impact on the perceived performance. Users will be more tolerant if they are well informed and can tuck the application away if they want to, or cancel the long operation. In Visual Basic, there are a couple of ways to address this. One is the old hack DoEvents. This remains in VB.Net as a method of the Application object. DoEvents harks back to the old days of cooperative multi-tasking. If you look up DoEvents in online help, it says, 'Processes all Windows



messages currently in the message queue.' In Windows, actions such as mouse clicks and moving windows generate messages, so when you call DoEvents in your long-running code, execution will pass temporarily to handlers for any such actions.

When they are complete, execution passes back to the long-running code. It's easy to pop DoEvents into your code, but best avoided. Here are two problems. First, you can get unexpected results from code re-entrance. A second click on the button that started the operation will cause it to run again. Other interactions can cause puzzling bugs. Second, these other events are only processed when DoEvents is called. This can result in jerkiness, if there is an interval between each call to DoEvents.

Ever seen an app do this? In this case the application has not really crashed, but try telling that to the user

The better solution is to use a background thread. This gives full control over the long calculation.

The downside is that threads introduce extra complexity. However, threads are becoming increasingly important, as the industry turns to multiple processors rather than faster clock speeds to improve performance. For example, figure 1 is a routine that counts prime numbers.

Note that isPrime in this code is a user-defined function, not built into Visual Basic; it's easy to implement or you can use any slow-running code. You can also simulate a long job with Thread.Sleep, which pauses the current thread for the interval you specify. In this case, the code refers to several controls on a form include a Label lbOutput, a TextBox txtNumber, and a ProgressBar ProgressBar1. If you run this code with a test value of say 100,000 you will notice how the application is unresponsive while it runs. The label called lbOutput never shows the value 'Working', because it has no chance to paint itself before the routine finishes. If you put another application window in front of the test application and then bring it back to the front, it may appear blank until the routine finishes. There is no way to cancel other than killing the process.

FIG 1

```
Private Sub BtnStart_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles btnStart.Click

    lbOutput.Text = "Working"
    Dim i As Integer = Integer.Parse(Me.txtNumber.Text)
    Dim iCount As Integer
    Dim iResult As Integer = 0
    Dim iPercent As Integer = CType((i / 100), Integer)

    For iCount = 1 To i
        If isPrime(iCount) Then
            iResult += 1
        End If

        If iCount Mod 10 = 0 Then
            ProgressBar1.Value = CType(100 * (iCount / i), Integer)
        End If
    Next

    ProgressBar1.Value = 100
    lbOutput.Text = "Primes counted: " + iResult.ToString

End Sub
```

(Key: ✓ code string continues)

Background threads

You can fix this using a background thread. A little plumbing is needed, but the result is worth it. To try this, start a new Windows Forms project in Visual Basic .Net and then add a new class to the project called PrimeCalc.

This class will be responsible for calculating the result on a background thread. The application needs to do the following: start the calculation running, allow cancellation and finally show progress and indicate completion

The easiest way to do this is with a Thread object. You will need to add:

Imports System.Threading
to the form module. Then add:

Dim t As Thread
as a field of the form class. Having a field makes it easy to keep a reference to the thread, so it can be cancelled. Before writing the code to start



the thread, you need to set a routine to update the user interface and before you do that, you need to declare a Delegate type. Add the following line at the top of the class module, PrimeCalc.vb:

```
Public Delegate Sub
UpdateUIDelegate(ByVal
sMessage As String, ByVal
iPercent As Integer,
ByVal bDone As Boolean)
```

A delegate is similar to a function pointer in other languages. If you have an object of type Delegate, you can call it as if it were the function it represents. In this case, the Delegate type will hold a reference to a method of the form class, used to update the user interface. There are two places this delegate will be used. First, it enables the application to pass a reference to the UpdateUI method to the PrimeCalc class. Second, it enables the application to update the user interface in a thread-safe manner.

User interface

In this application, the user interface will be running on a different thread than the background calculation. In the .Net Framework, it's not safe to call user interface methods from a different thread as the application is likely to be unstable. However, the Framework provides a means of doing this safely, through the BeginInvoke method of the Control class.

BeginInvoke lets you call a method on one thread from another. The method takes two arguments. First, a Delegate object pointing to the function to be called and second, an Object array containing the arguments to be passed to the function.

Some methods may not always be called from a different thread. You can detect if it's running on the same thread using the InvokeRequired

property. The following example shows how this works. You do not have to use these arguments, as long as the method matches the Delegate declaration (see figure 2 below).

Passing data

Typically, you will need to pass arguments to the thread when it starts. However, the constructor for the Thread class is a ThreadStart delegate which does not allow for arguments. One solution is to add private members to a class encapsulating your thread, in this case PrimeCalc, and set their values in the constructor. Here is the code from PrimeCalc.vb:

```
Private i As Integer '
number for which to count
primes
Private UpdateUI As
UpdateUIDelegate
Public Sub New(ByVal
iTestVal As Integer,
ByVal UpdateUIDlg As
UpdateUIDelegate)
Me.i = iTestVal
Me.UpdateUI =
UpdateUIDlg
End Sub
```

Note that the key issue with threads and data is controlling what happens when multiple threads access the same variables. If you need to do this, check out the thread synchronization features in .Net

Calling the thread

Now that the plumbing is in place, you can write code to run the background thread. There are several things to consider. What happens if the user tries to start a second calculation is in progress? You might cancel the existing thread, prevent the new one or, in some circumstances, allow both. The IsAlive property is a handy way to check whether an existing Thread object has terminated. Here is an example of how to start the new thread:

```
Dim i As Integer =
Integer.Parse(Me.txt
Number.Text)
' You should also check
for number out of range
Dim pc As New PrimeCalc
(i, AddressOf UpdateUI)
'don't allow a new count
if count is in progress
If Not IsNothing(t) Then
If t.IsAlive Then
MsgBox("Count already
in progress")
Exit Sub
End If
End If
t = New Thread(AddressOf
pc.CountPrimes)
```

```
't is a field of the
form class
If Me.chkLow
Priority.Checked Then
t.Priority =
ThreadPriority.Lowest
End If
t.Start()
```

An advantage of using threads is that there are several ways to cancel them. The following example uses the Abort method. This raises a ThreadAbortException in the thread. However, the thread may not die instantly. Finally clauses will execute, and the thread may handle this exception and call ResetAbort to refuse the request. This is not the case with PrimeCalc, but it's still wise to call the Join method after Abort. Join means 'wait until the thread terminates before continuing'.

```
If Not IsNothing(t) Then
If t.IsAlive Then
t.Abort()
t.Join() ' wait for
thread to end
Me.lbOutput.Text =
"Cancelled"
Me.ProgressBar1.Value
= 0
End If
End If
```

Other considerations

Now that you have a thread running here are a couple of other things to consider. For example, what happens if the user closes the form while a thread is active? You need to explicitly cancel the thread, or the code might behave unexpectedly. Another consideration is exception handling. While the thread is running, it's outside any exception handlers in your main thread. It's best to handle exceptions within the thread code. If an unhandled exception occurs, your application will not crash, but the user will see an ugly system message. There is a way of handling these exceptions, by adding a handler for the Application.ThreadException event. Typically you add this handler this in the Main method before calling Application.Run. By doing this, you can catch most exceptions and present a user-friendly message to the user, in place of the perplexing .Net default exception handler.

The code for this application can be downloaded from www.itwritings.com/pcw.

CONTACTS

Tim Anderson welcomes your comments on the Visual programming column. Email him at: visual@pcw.co.uk. Please do not send unsolicited file attachments.

FIG 2

```
Public Sub UpdateUI(ByVal sMessage As
String, ByVal iPercent As Integer,
ByVal bDone As Boolean)
If Me.InvokeRequired Then
Dim dlg As New
UpdateUIDelegate(AddressOf
Me.UpdateUI)
Dim objects() As Object = {sMessage,
iPercent, bDone}
Me.BeginInvoke(dlg, objects)
Else
Me.lbOutput.Text = sMessage
Me.ProgressBar1.Value = iPercent
If bDone Then
MsgBox("Count complete")
End If
End If
End Sub
```

(Key: ✓ code string continues)



The definitive guide to Service Pack 2

Solve your SP2 problems and install with confidence using our troubleshooting guide

P CW has spent six months testing Windows XP Service Pack 2 (SP2) extensively and collecting user reports about problems. Our troubleshooting guide will show you how to wave goodbye to blue screens, incompatible software and pointless error messages.

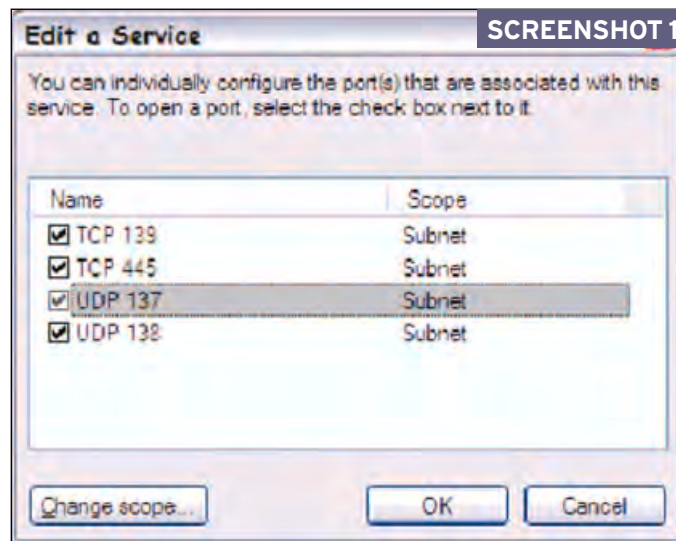
The wide-ranging improvements and updates introduced to Windows XP by SP2 can cause a heap of problems that, in the worst case, can render your PC unusable. This is because when Microsoft released the final version of SP2 in August 2004, it did not contain just a collection of patches, but also some new security features. For example, the new memory protection technology is not compatible with all application programs. In addition, because of the conservative default settings used by the Windows Firewall, some programs may no longer work as expected.

However, nine months down the line, patches, workarounds and practical solutions for most of these problems have appeared. By following our advice you can finally benefit from SP2's improved security and usability features without having to risk program crashes and system conflicts.

Many of these solutions are aimed at quite advanced users and involve editing the Registry or other vital system files – you should always fully back up your data to a safe location before attempting any such modifications. If you're unsure of how to proceed, we recommend you enlist the help of someone familiar with advanced Windows techniques.

Incompatible programs

According to an online survey carried out by PCW's sister magazine in Germany, *PC Professionell*, utility programs cause the most frequent problems for Windows XP with SP2. The usual consequences are program crashes or blue screens. Microsoft has a list of programs that are not compatible with SP2 on its support site (<http://support.microsoft.com/kb/884130> and <http://support.microsoft.com/kb/842242>). These include several security utilities, such as the Black Ice intrusion detection software and some versions of the Kaspersky Antivirus scanner. The list



also includes some Microsoft programs, for example Virtual PC. Table 1 on page 188 contains a listing of further problems and solutions.

Resolving problems

Many programs have problems with Microsoft's new Data Execution Prevention (DEP) technology. Windows XP uses this technology to prevent the execution of potentially malicious code in memory areas reserved for data. There are two ways around this: you can either get an update from the program manufacturer or turn off DEP (see solution on page 188). However, if you do turn off DEP, your PC will remain at the level of Service Pack 1.

SP2 addresses around 870 problems in the Windows XP family (<http://support.microsoft.com/kb/811113>), but it is anyone's guess how many problems are left undiscovered in the approximately 50 million lines of code. On page 184 we'll tackle the most common SP2 problems that we were able to reproduce in our labs. We've come up with a solution for each of the 32 listed problems.

Upgrade and slow down?

About 24 per cent of the SP2 problems reported in the online survey concerned drops in performance after installation. We carried out a thorough test, measuring the effects of installing SP2 on machines in three different categories. The platforms, tests and test results are shown in boxouts on page 186. If you have performance problems on your

PC after installing SP2, check out the tips starting on page 184.

A further 18 per cent of the SP2 users who took part in the online survey reported problems with the new functions and changed defaults. Most of the problems were with DEP, but the new Windows Firewall was also named as a frequent source of problems. The reason for this is that, in SP2, the Windows Firewall is enabled by default for all network connections.

Installation

Fourteen per cent of the problems reported were related to the installation routine. Most were due to not having enough free hard disk space for SP2, which causes the installation to display an error message and then hang. A further 12 per cent of those surveyed reported hardware problems, non-functioning wireless LAN adapters, Bluetooth dongles or printers.

Network administrators in many organisations have decided against allowing ad hoc upgrades – new PCs with SP2 pre-installed are integrated into existing networks, but installing the Service Pack on existing computers is considered too risky. Private users are the main beneficiaries of the new functions: the revamped firewall is rarely used in a corporate environment.

Microsoft support

At Microsoft's support line, the most common calls relate to incompatible third-party software that conflicts with either the Windows Firewall or DEP.

The second most frequent calls concern installation problems, such as a non-functioning Windows Update or continual rebooting. And in third place are calls about the Windows Firewall itself. Usually, the hotline staff have to explain how to open individual ports.

Microsoft told us that over 100 million copies of SP2 have been circulated worldwide; against that vast figure, the number of support calls is tiny. 2004 was a record year for viruses according to the



SP2 quick tips

Enable memory protection

Microsoft has added a memory protection function, Data Execution Prevention (DEP), in SP2. Some programs can have problems with this feature.

You can adjust the settings and disable DEP for a particular program by choosing System in the Control Panel, selecting the Advanced tab, clicking on the Settings button in the Performance section and choosing the Data Execution Prevention tab.

Overriding the Windows Firewall

SP2 automatically enables the built-in Windows Firewall for all network connections. If you have problems exchanging data between XP computers after installing SP2, then you should check the Firewall settings.

You can get to the Firewall settings from the Control Panel by double-clicking on the Windows Firewall icon. On the Exceptions tab, you can allow file- and printer-sharing unhindered network access or open specific TCP and UDP ports for incoming access.

Silence the Security Center

The Security Center displays irritating balloon tips if it thinks that Automatic Updates, the Firewall or your anti-virus scanner are not set up correctly.

If you do not want to turn the balloon tips off by editing the Registry, then the easiest way to get rid of them is by clicking on 'Change the way Security Center alerts me' on the Resources pane of the Security Center, and then unchecking the Alert Options.

Turn the Security Center off

The Security Center is the most obvious new feature in SP2. The monitoring of your virus scanner, firewall and automatic updates is useful for beginners but experienced users can manage without it. In the Start menu, choose Run and type in 'services.msc'.

Select the Security Center entry and right-click on it, then select Properties from the context menu. Choose Disabled as the Startup type. You can do this from the command prompt using the command 'sc config wscsvc start= disabled' without going through the console. Note: there must be a space after the equals sign.

publishers of anti-virus software, who welcome SP2 because of its emphasis on improved operating system security. They say that the roll-out of SP2 is the biggest security campaign ever mounted by Microsoft.

Install despite problems

Our labs tests have shown that SP2 causes few problems if you consider the extensive changes it introduces. If you're still having trouble, you should be able to find solutions later in this feature.

A big problem is that Microsoft continually releases patches for security problems but does not address the causes.

The best – or worst – example is Internet Explorer: despite SP2, it still has a critical security leak or two.

The well-known jpeg/GDI+ problem (which allows a hacker to take over your system via a specially crafted jpeg file) demonstrates that even if SP2 is installed, you should still be careful if you use Internet Explorer.

Troubleshooting guide

Over the next few pages, you'll find over 30 practical solutions to the most common SP2 problems.

SP2 is not just any old update for Windows XP, but an all-round renewal that includes far-reaching

system changes. Our advice is that you should install it, but make a backup of your system first.

We've combed the Microsoft Knowledge Base and user forums for problems, gone through readers' letters and spent several months pursuing the problems in the labs.

The result is the following troubleshooting guide, which contains practical ways of ironing out problems with SP2.

The built-in Windows Firewall in SP2 does not just make files accessible over the local network, but to the whole Internet. This affects all users who access the Internet via a dial-up network connection and have enabled file- and printer-sharing in the Firewall's exceptions list

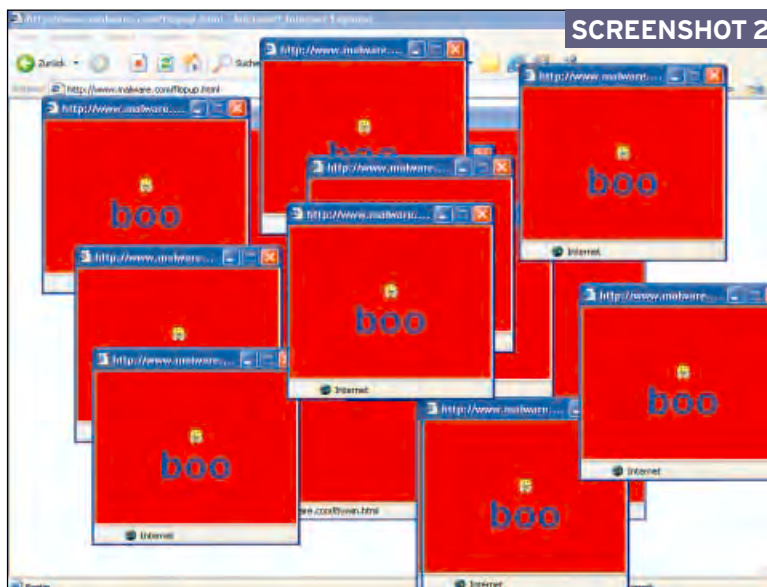
Microsoft has made a patch available for this problem. The blame, according to Microsoft, lies with an error in the way some dial-up connections configure routing tables, leading to the firewall interpreting the local subnet as the whole Internet. This can make files and printers accessible to any Internet user. <http://support.microsoft.com/kb/886185>

At irregular intervals, Windows XP with SP2 installed causes bluescreens containing the message Stop 0x05 (INVALID_PROCESS_ATTACH_ATTEMPT)

The cause of the bluescreen is a coding error in the file http.sys, which can damage the stack. In conjunction with the TDI filter drivers (Transport Driver Interface), as installed by firewalls or virus scanners, this can lead to the stack being illegally overwritten. Windows stops this illegal operation with a system interrupt, causing the bluescreen described above. Microsoft has made a patch for this problem available. <http://support.microsoft.com/kb/887742>

The revised version of Internet Explorer in SP2 does not

Some old problems remain: a demo shows how unwanted pop-up windows still appear in the updated version of Internet Explorer in SP2 in spite of the Pop-up Blocker





display sites which use pop-up windows correctly or only blocks certain content

If you visit sites that use pop-ups, there are several settings available in Internet Explorer. They can be adjusted from the dialogue reached by choosing Tools/Pop-up blocker/Pop-up blocker settings. You can exclude specific websites from the blocker by using an Exceptions list. The default filter level is Medium.

According to Microsoft, this blocks most pop-ups. If you are still plagued by advertising windows, selecting the high filter level will block all pop-ups. The problem is that this will prevent a new window from opening even if, for example, you have clicked on a thumbnail image to enlarge it. The only way round this is to press Ctrl.

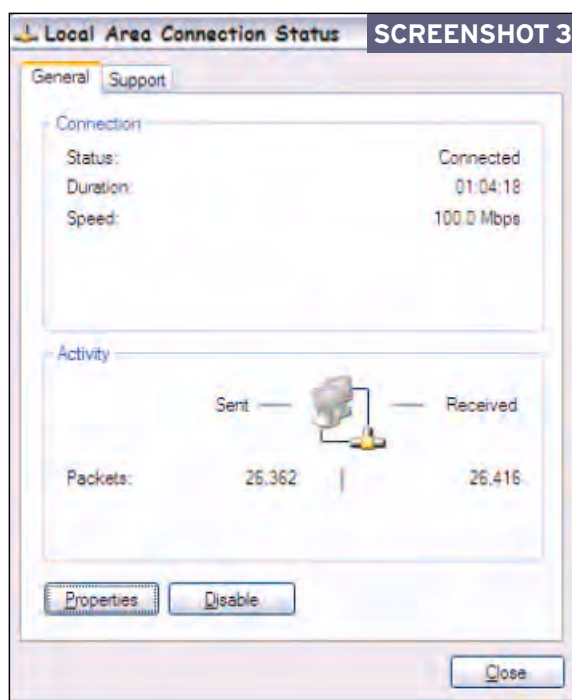
The Pop-up-blocker has no effect on pages that you have included in the Local Intranet and Trusted Sites zones. If new browser windows keep opening despite restrictive settings, this is often a pointer to browser hijacking or spyware on your system.

The setting Show information bar when pop-ups are blocked is very helpful. When a pop-up is blocked, an information bar appears below the menu bar; by clicking on it you can allow the Pop-ups despite the preset setting.

The blocker isn't perfect. A demo at www.malware.com/flopup.html (this site pops up multiple small windows for a few seconds (see screenshot 2) but it is not malicious) shows how pop-ups can be displayed even with the most restrictive settings. Turn off Active Scripting in the Internet Options/Security tab to guard against this.

When configuring a Wifi adapter there are conflicts between the SP2 Wireless Networking Wizard and the manufacturer's wireless configuration utility

Our labs tests do not show a consistent picture. Windows with SP2 often attempts to grab control of the wireless network settings for itself. However, on pre-configured notebooks, the manufacturer's own utilities often seem to take precedence. Neither Windows nor the manufacturer's tools will let you know if there's a conflict. The consequences are unexpected errors, the exact causes of which are hard to pinpoint. If you want to solve the problem, choose one configuration tool and turn off the other one. As the manufacturers' tools are usually easier to use and



better tailored to the hardware than the XP Wizard, it is a good idea to turn it off (Control Panel/Network Connections/[wireless connection] then uncheck 'Let Windows manage my wireless connections').

If you use the new SP2 Wireless Networking Wizard, under some circumstances you might not get a wireless connection, even though your access point is working

Those affected are often notebook users who can turn off the wireless adapter on their machine with a switch or via a function key. Even if the adapter is turned off, Windows will still look for a wireless network and simply report that there is no network in range. XP doesn't tell you that the adapter is powered off. One of the only ways to tell is by looking at the wireless adapter's power LED to check its status. Alternatively, many of the manufacturers' own control programs will warn you when the radio is deactivated.

After installing SP2, computers with an Athlon 64 CPU suddenly restart, after which the computer hangs with a blue screen and the message 0x000000FC (ATTEMPTED_EXECUTE_OF_NOEXECUTE_MEMORY) is displayed

The problem is caused by the driver mpegport.sys, which is used by some hardware DVD decoders. This interacts with the hardware memory protection used by the Athlon 64 and

SP2 often reports connection problems for no good reason

illegally executes code in memory. Windows stops this and grinds to a halt with the error message mentioned. The restart is caused by the Windows default settings.

The simplest solution is to install a driver update that adds an SP2 compatible version of mpegport.sys. In an emergency, turn memory protection off. To do this, boot into Safe Mode using F8 after the Bios screen loads. Choose Run from the start menu and enter the command cmd to open a command window. Enter bootcfg/raw "/noexecute=alwaysoff/fastdetect" lid 1 and then press Enter. If you run multiple Windows XP installations, make these changes by editing the boot.ini system file with Notepad. The value of the /noexecute parameter in this file should be set to 'alwaysoff'.

<http://support.microsoft.com/kb/878474>

Installation of SP2 fails on Pentium 4 systems and the computer crashes

This problem affects computers with Pentium 4 or Celeron D processors that use the Prescott kernel (C0 stepping) manufactured using the 90nanometre process. The SP2 installation routine conflicts with some incompatible Bios versions. If you want to find out whether you are using one of these processors, then before installing SP2 you should use the set command's PROCESSOR_REVISION variable. To do this, choose Run from the Start menu and open a command window by entering cmd and then typing 'set PROCESSOR_REVISION'. If the processor returns a hexadecimal ID of 0F33, then you should check your motherboard manufacturer's website for information on the Bios's compatibility with SP2. You might need to update the Bios before SP2 can be installed on your computer.

Installation of SP2 fails because of insufficient free hard disk space

Microsoft says that the minimum system requirements for installing SP2 are a 233MHz processor, 64MB Ram and 1.8GB free hard disk.

In reality, it depends on how SP2 is installed. When installing from CD, about 1.4GB is needed, made up of the following: around 500MB of data is copied from the CD to the Windows folder under the description ServicePackFiles. On top of this is the 495MB, which SP2 takes up itself. In addition, 260MB is needed for the installation and



SP2's effect on performance

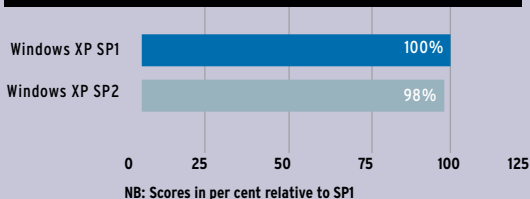
A quarter of readers' letters reporting problems with SP2 complain about slowdowns in performance after installing the update. The complaints are not of differences in application benchmarks but of slowdowns in performance that make everyday tasks more difficult. In many cases those affected have been annoyed enough to remove SP2.

To get to the bottom of this, we set up three computers in our test labs: a notebook, a 32bit PC and a 64bit PC. The computers were installed with fresh copies of Windows XP SP1 and all available patches up to the release of SP2. After this we ran our standard PC benchmarks (see How we test on page 12). Then we installed SP2 and ran the tests again.

The results showed that computers with SP2 were not slower. The slight differences we found were well within the tolerance of the measuring technique.

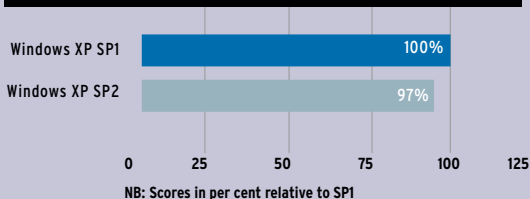
Obviously, since we ran our tests on clean installations of Windows XP, we can't say whether there are any specific performance issues associated with particular hardware devices or applications after installing SP2, but it's clear that just installing SP2 itself on a clean Windows install doesn't appear to affect performance at all.

Pentium M notebook



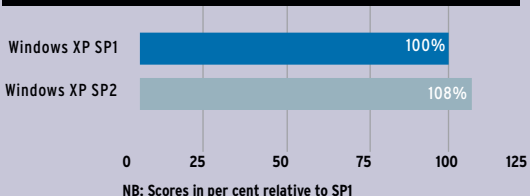
Pentium M 725, 512MB of Ram, 60GB hard disk, ATI Mobility Radeon 9700 graphics

32bit PC – Athlon XP



Athlon XP 1.6GHz, 256MB of Ram, 60GB Hard disk, Nvidia GeForce 2 Titanium graphics

64bit PC – Athlon 64



Athlon 64 2.2GHz, 1GB of Ram, 60GB hard disk, ATI Radeon 9800 graphics

NB: All the differences measured in our Labs tests are within the error and repeatability limits of our benchmarks, showing that there's no important performance difference between the two Service Packs.

200MB for the uninstall files. Less space is needed for an online update or a network installation – only those patches that have not yet been installed are copied over, which reduces the files in total to about 100MB in size.

Some storage space can be freed by using the defragmentation and Disk Cleanup tools. If that doesn't do the trick and you have multiple partitions on your hard drive, then you can use a partitioning program such as Symantec Partition Magic or Paragon Partition Manager to increase the system partition size.

<http://support.microsoft.com/kb/837783>

SP2 installation will not start on notebooks even though the system requirements are met

Even if the battery is fully charged, you must connect the notebook to the mains supply before starting installation of SP2. Usually the setup routine will issue a reminder message.

Network connectivity error warning messages appear although everything is working correctly

The message is to let you know that the network connection is either not working at full speed or is intermittent. However, when using SP2, the warning appears now and then for no apparent reason. There are two possible solutions: either to turn the warnings off altogether

(using the General Properties tab of the Network Connection) or enter the Lan connection's IP addresses by hand, as the problem only crops up when using a DHCP server.

SP2 installation stops with an error message pointing to problems with atapi.sys

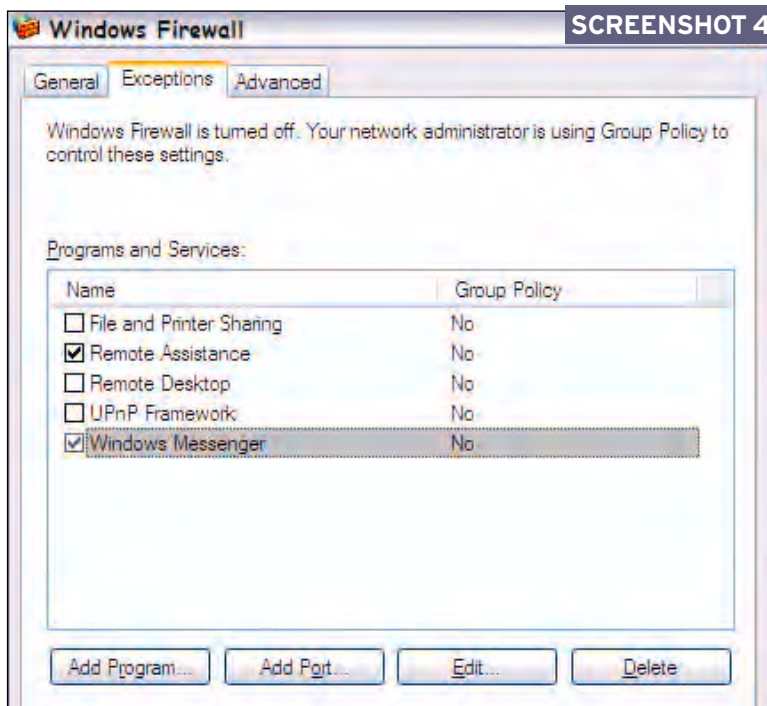
This problem also appeared when installing SP1 and seems not to have been fixed for SP2. Our labs tests show it's safe to ignore this message. You can simply rename atapi.sys and restart the installation.

The SP2 installation routine appears not to recognise the kernel as a valid Windows file, and the installation has to be terminated at this point

The kernel file – ntoskrnl.exe – may have been modified by another program. The only solution is to restore the original file from the XP installation CD.

During installation there are repeated restarts with the error message 'Stop: c0000135 Component not found – winsrv was not found'

SP2 fails due to an adware program from Total Velocity Corporation, which is included in the TV Media utility (bundled with some ad-supported programs). It installs various files that gather information on your system. These files also monitor certain Registry keys in



The Windows Firewall exceptions need to be changed for Instant Messenger



order to stop the adware being uninstalled. This overblown protection mechanism damages the Registry during SP2 installation, and Microsoft provides a free program to remove the adware without leaving any traces.

<http://support.microsoft.com/kb/886590>

Bluetooth devices that worked fine with Service Pack 1 are no longer recognised by Windows

Microsoft has included new Bluetooth drivers and a new Setup Wizard in SP2. Installed drivers can be overwritten with the new XP system drivers. If you then want to add devices, you might just get a series of 'Device not found' error messages. The answer is to rename the bhf.ini file, located in the C:\Windows\inf folder.

After this you can start the Registry Editor using Start, Run and the command regedit, and then delete the Bluetooth entry in HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Run. You should now be able to install the manufacturer's drivers without difficulty. <http://support.microsoft.com/kb/840635>

After upgrading to Service Pack 2, some Bluetooth devices only have limited functionality

Once again, the blame lies with Microsoft's own Bluetooth drivers. They only support a limited number of the Bluetooth profiles that are responsible for device functionality. You should install the device using the manufacturer's own driver.

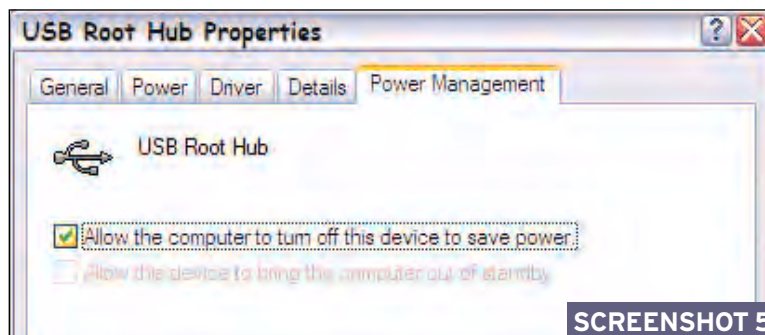
To do this, choose Run from the Start menu and enter the command devmgmt.msc. From the list of Bluetooth Wireless Devices, select the relevant adapter and click on Properties. On the Driver tab, select Update Driver and point it to the third-party driver.

<http://support.microsoft.com/kb/883258>

Using SP2, Internet Explorer does not display some web pages. Instead of the page content, you get an error message saying that the page cannot be displayed

According to Microsoft, this problem is caused by some DNS servers that do not give compatible replies to queries from IPv6 clients. One workaround is to remove IPv6.

To do this, open a command window by choosing Run from the



Problems with power management prevent USB devices from waking up

start menu and entering cmd, then pressing Enter, then issuing the command 'netsh interface ipv6 uninstall'. <http://support.microsoft.com/kb/815768>

You are out of luck if you have included script functions in HTML pages and want to test them locally on a PC running SP2. Internet Explorer will no longer execute local code; instead it displays the HTML in the browser

Under Tools/Internet Options in Internet Explorer, go to the Advanced tab and enable 'Allow active content to run in files on My Computer'.

Two identical tabs for Windows Update (Automatic Updates) appear in the system properties

This is easily fixed by making a minor change to the Registry. Choose Run from the Start menu and enter regedit to start the Registry Editor. Navigate to the entry HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Controls Folder\System\shellex\PropertySheet Handlers. You'll see two copies of the Auto Update Property Sheet Extension entry. Delete one copy and, after a restart, only one tab will be visible.

Since installing SP2 your PC has been noticeably slower

In our labs tests (see page 186), we could not confirm this behaviour. However, after installing a Service Pack you should always check for and install any updates or patches for installed software. The same goes for hardware components: always install device driver updates as this will ensure your hardware is working optimally.

Outlook Express no longer displays pictures in emails; placeholders are shown instead

SP2 updates Outlook Express and, among other things, there is a new 'Block images and other external content in HTML email' option, which is enabled by default. You can easily turn it off from the Security

tab of the Tools/Options dialogue. <http://support.microsoft.com/kb/843018>

XP with SP2 seems to forget to load some drivers at startup

SP2's new Driver Protection is supposed to protect the operating system from being damaged by faulty device drivers. The Driver Protection List contains a list of drivers that will not be loaded during startup. Unfortunately, as Driver Protection can't be disabled or modified, the only answer for end users is to use drivers that are not blocked.

<http://support.microsoft.com/kb/883775>

Some instant messaging programs, such as ICQ or Miranda, won't work any more with SP2

The programs are working, but the firewall needs to be correctly configured. As messaging programs need to open a port so that they are contactable from outside you have to define firewall exception rules for them. At the first connection attempt, the Windows firewall should ask you whether it should create an exception rule automatically. In the case of Windows Messenger, you should allow this. If you are not asked, then you can create an exception rule manually for the messaging client via the Windows Firewall applet in Control Panel.

Remote access fails on a Windows XP computer with SP2

Once again this is the fault of the Windows Firewall, which blocks access from outside. You'll have to define firewall exceptions allowing remote access for Windows Netmeeting and the remote share system service mnmsrv.exe. The procedure is described in a Microsoft Knowledge Base article. <http://support.microsoft.com/kb/878451>

After installing SP2, deleting files from the Explorer context menu no longer works. Right-




Table 1: Programs that have problems with SP2

PROGRAM	VERSION	PROBLEM	SOLUTION
AOL Toolbar	1.13.2	Information bar blocks toolbar	Update to newest version
Backup Exec	9	Client backup does not work properly	Set a Firewall exception for beremote.exe
Bitdefender	7.2	Will not install on Athlon 64	Restore the original kernel – ntoskrnl.exe
BladdCE	3.6crj	Program terminates with stop error	Turn off DEP
Bootskin	All	Stop error during installation	Turn off Bootskin before SP2 installation
Command Antivirus	4.9	Error during program start	Turn Windows Firewall off
Etrust EZ Armor	1	Stop error during Firewall startup	Install manufacturer's patch
Kaspersky Antivirus	4.5, 5.0	Real-time searches on Athlon 64 systems	Install manufacturer's update
Live Motion	1	Errors during use	Support document at www.adobe.com/support/techdocs/326452.html
Mpegcraft DVD	All	Errors when saving	Turn DEP off
NOD32	6.09	Program overwrites network settings	Install manufacturer's update
Norman Personal Firewall	1.4	Firewall wizard does not start	Install manufacturer's update
Norton System Works	2003/2004	Driver error on 64bit machines	Install manufacturer's update
Omnipage Pro	11	Error when removing the program	Upgrade to version 12 or higher
Outpost Firewall	2.1	Unexpected restarts when program is run	Turn DEP off
Pinnacle Studio	9	File execution errors on 64bit CPUs	Turn DEP off
Style XP	2	Unexplained crashes	Install manufacturer's update
Virtual PC	2004	Loss of performance on virtual machines	Install Service Pack 1 for Virtual PC
Visual Studio .Net	All	DCOM remote debugging not working	Define exceptions in the Firewall
Winroute Pro	4.2.5	Crash during installation	No solution, support suspended
Word Perfect Office	10,11	Startup problems	Install manufacturer's Service Pack
Zone Alarm	3.7, 4, 4.5, 5.0.590	Page or stop errors at startup	Install version 5.1 or higher

clicking on a file in Explorer and choosing Delete causes a crash

We were unable to reproduce this on any of the test PCs in our labs. However, this has been reported by many users, so we're going to recommend a suggestion that has been made in several web forums.

The problem seems to be caused by the new DEP module, a measure introduced to protect against buffer overruns. To turn DEP off completely you'll have to alter the C:\boot.ini file. Right-click on the file and choose Properties, then turn off the read-only attribute. You can then open the file with an editor such as Notepad. Find the entry which begins with multi(0)disk(0). At the end of this entry there is the /fastdetect option, and for SP2 installations there is also /noexecute for the DEP feature. If you change /noexecute to /execute, then code will continue to be executable in data storage areas and DEP will no longer be active. After doing this, you should be able to delete files from the context menu again.

USB devices that worked fine under SP1 are no longer recognised after upgrading to SP2

SP2 does not update the USB drivers. Simply unplug and replug the USB cable so that Windows XP starts a search for new drivers automatically.

USB devices, usually mice and keyboards, suddenly stop working and only wake up after the USB cable has been unplugged and reconnected

This happens because SP2 is incompatible with the USB port's power-saving mode. In Device Manager, use the Power Management tab in the Properties sheet for each USB Root hub and uncheck the box labelled 'Allow the computer to turn off this device to save power'.

After installing SP2 the Firewire connection speed slows down dramatically

Microsoft explains this problem in a Knowledge base article and blames the Firewire SP2 drivers. Under some circumstances, the data transfer rate can be limited to the slowest rate of 100Mbps/sec.

A patch available from the URL below removes this limit. For Firewire controllers that have been added after SP2 has been installed, a delve into the Registry is needed as well. Navigate to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Enum\PCM394_hc_hw_id\1394_instance_id\DeviceParameters. This should contain an entry called Sidspeed. If not, create a new DWORD entry with that name and the Value Data set to 3. <http://support.microsoft.com/kb/885222>

SP2 can cause problems that can only be fixed by uninstalling it. These might include crashes after the installation, despite carrying out driver and program updates

There are some occasions on which it is necessary to uninstall SP2. Microsoft describes several ways of doing this, but the first you should try is via Add or Remove Programs applet in Control Panel. After removing the Service Pack, you should perform a System Restore to restore your PC to a time before you installed the Service Pack.

Another way to uninstall SP2 is to click Start/Run and type in 'c:\windows\%NtServicePackUninstall%\spuninst\spuninst.exe', then follow the instructions. At the URL below, Microsoft also details a method using the Recovery Console, but this is complicated for anyone who's not familiar with the Console.

If you have to, try a fresh install of the operating system. <http://support.microsoft.com/kb/875350>

Jörg Geiger

Further information

Official Microsoft Windows XP Service Pack 2 website: www.microsoft.com/windowsxp/sp2
Microsoft Newsgroup Support: <http://support.microsoft.com/newsgroups>

Leisure

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LOADING...



Join Eminem's gang

US hip hop collective D12 have signed a deal with Konami to provide voiceovers, likenesses and original music for a forthcoming PC game. The six-man group, which includes superstar Eminem, will feature in a free-roaming beat-em-up entitled *Crime Life: Gang Wars*.

There's no word as to whether Slim Shady himself will feature in the game, but players take control of Tre – a youngster trying to fight his way to the top of the criminal ladder in Grand Central City. As a new member of the Outlawz gang, Tre must prove himself by carrying out missions and enhancing his reputation. Bizarre, the most rotund member of D12, will play the head of a rival gang, while the remaining four members play his lieutenants. Konami promises a mission-based game structure across 10 large environments, with the game's emphasis being hand-to-hand combat. We'll bring you a full review of *Crime Life: Gang Wars* closer to its release date.

Hip hop fans should also check out next month's *PCW*, as we'll be taking a look at a forthcoming video game from rapper 50 Cent.

Driver 3

Infiltrate Miami car-thieves, but beware of the tricky controls



The Xbox version of *Driver 3* stirred up a hornet's nest of controversy when a rival publication awarded it near-perfect review scores, only for it to be subsequently branded by the general public as one of the worst games in recent history.

We had hoped that the nine-month gap between the existing console versions and the newly released PC outing would have given the game's developers ample time to iron out the bugs that plagued the original – but our hopes were dashed.

The game follows the same storyline as the Xbox version. Players assume the role of a 1970s cop named Tanner, who must infiltrate a Miami-based car-stealing syndicate that aims to steal 40 exotic cars for distribution outside the city.

The basic gameplay will be familiar to anyone who has played previous games in the series or indeed the revered *Grand Theft Auto* series. It's played from a third-person perspective and the central character is able to run around on foot, shoot bad guys and drive a wide variety of cars, boats, bikes and so on.

You'll spend a lot of time behind the wheel – much of it feeling frustrated

As enticing as this may sound, within seconds of playing *Driver 3* we found ourselves remarking at just how unappealing the experience was. All *PCW* staff who played the game commented on how bad it was, with particularly venomous comments reserved for the atrocious default control scheme.

In most games, it is usually possible to work out the controls on the fly, but this is nigh on impossible in *Driver 3*. With character direction controlled by the mouse and movement using the usual W, A, S and D keys, we expected the left mouse-button to be used as a trigger. Instead, the trigger

button is defaulted to the 5 key on the numeric keypad. Unless you have three arms or intend to use your tongue to shoot, it's impossible to control the character properly.

You can customise the control scheme to one that suits you better but this is extra hassle.

As its name suggests, much of *Driver 3* is spent behind the wheel. Driving in a straight line is easy but taking a corner at speed will usually result in an impromptu doughnut – not ideal when most missions require precision cornering.

It's a shame *Driver 3* is so bad, since the series has great potential. Persistent players may get some enjoyment out of it but we recommend waiting for the PC release of *GTA: San Andreas*.

Rory Reid

DETAILS

PRICE £24.99

CONTACT Atari

www.uk.atari.com

SYSTEM REQUIREMENTS

Windows XP/2000 • Pentium 4
2GHz • 256MB Ram • 5.5GB of hard
disk space

VERDICT

**It promised much, but
disappoints in almost
every department**

OVERALL

★ ★ ★ ★ ★





Competitions

194 Win a copy of Stronghold 2 with a Dell Inspiron 9300 notebook or one of three copies of Filemaker

For your chance to win turn to page 194



The Matrix Online

A new and inspired spin on the story



The Matrix movies lend themselves very well to a videogame adaptation but, until recently, developers have been unwilling to produce titles that focus on anything other than the fast-paced action sequences in the movies.

The Matrix: Online goes a brave step further, exploiting the movie storylines for use in a massive online multiplayer game. It takes place inside the Matrix after the events depicted in *The Matrix: Revolutions*, where the machines have called an uneasy peace with humans.

You begin by serving in Zion, where you are introduced to the story and taught how to play. Later, you move to the Matrix itself, where you can form allegiances with other humans, machines or a third faction called Exiles – self-aware programs living in the Matrix. Loyalty to a group doesn't have any real impact on what happens in the game, since all carry out similar missions.

The game plays like most real-time strategy titles. Many missions follow the standard fetch-and-retrieve brief, but we were impressed by the combat. Although this is turn-based, it is influenced by the kung-fu sequences of the movies and is entertaining to watch.

Also impressive is the fact that players aren't forced to adopt a particular character class; instead, you can mix and match abilities to your satisfaction. Your character's experience level will increase fairly slowly but, like characters from the film were able to acquire new skills (flying a helicopter, for example), you can customise your proficiency in any of the game's three character branches – coder, hacker and operative – as needed.

On the whole, we enjoyed The Matrix Online. It is a little rough around the edges in places and it suffers from the same repetitive gameplay that is inherent to the genre, but RPG fans who like the movie should find it a blast.

Rory Reid

DETAILS

PRICE £34.99

CONTACT Sega

www.sega.co.uk

SYSTEM REQUIREMENTS

Windows ME/XP or above • 512MB of Ram • 64MB video card with T&L • 1.4GHz CPU • DirectX 8.1 compatible sound card • 4-8GB of hard disk space • 56k modem

VERDICT

Has some inspired touches and uses the Matrix story to great effect

OVERALL



GTR

Authentic racing with a steep learning curve



With such an assortment of real-time strategy games available for the PC, it is easy to forget that the format is home to some excellent racing games. The latest of these is GTR from Simbin – a game touted as the most realistic in its genre.

It depicts the action of the FIA GT Championship and includes 10 tracks and a selection of over 70 cars. As with most simulations, GTR is initially difficult to get accustomed to, but players can start off in the Arcade mode to familiarise themselves with the mechanics of play.

The game has several difficulty levels, the easiest of which (Sunday Driver) will automatically apply the brakes, and even steer for you if you get out of line. The most difficult mode (Alien on Wheels) thrusts you into races with a full contingent of rivals, minimal assistance and full damage modelling.

Things get even more difficult in the Semi-pro or Simulation modes. In the latter, you'll repeatedly find yourself spinning off the track, but once you've spent a few hours learning how the cars handle, it is a very rewarding experience.

There is also an online racing mode, in which you can compete against other players from around the world.

Despite its steep learning curve, GTR is an excellent game. Cars handle realistically (a little too realistically for the casual gamer) and it is obvious the developers have paid tremendous attention to detail.

Some gamers may prefer the broader appeal of games such as Gran Turismo but, for real petrol-heads, GTR is arguably the most authentic depiction of GT racing we've ever seen. A word of warning though: don't even think about playing this game without a steering wheel.

Rory Reid

DETAILS

PRICE £34.99

CONTACT Simbin

www.simbin.com

SYSTEM REQUIREMENTS

Windows ME/XP or above • 512 MB of Ram • 128MB DirectX 8 video card with T&L • 2GHz CPU • DirectX 8.1 compatible soundcard • 4-8GB of hard disk space

VERDICT

GTR is initially frustrating, but is unquestionably one of the best examples of the genre

OVERALL





Spectrum +2 & +3

How Amstrad managed turn the Spectrum's last gasp into a money-making opportunity

Sinclair's financial figures of spring 1985 revealed the impact of disappointing QL sales and the cost of producing the almost-universally derided C5 electric trike. The previous year's profits of £14.28m on a turnover of £77.69m had turned into a pre-tax loss of £18m. In May, the company confirmed it was seeking up to £15m for restructuring and growth, and the following month Robert Maxwell announced a rescue bid. An agreement was made, but pulled in August and, by the end of 1985, Sinclair's vehicle division went into voluntary liquidation. Sinclair the company was in crisis and desperately in need of cash. The unlikely knight in shining armour, though, turned out to be none other than arch-rival Alan Sugar of Amstrad.

Sinclair recalls hearing from Sugar while the Amstrad boss was on holiday. Sugar offered to buy Sinclair's company and they met on Good Friday 1986 to hammer out a deal. Sugar emerged having paid £5m for the entire rights to Sinclair's computer products, but he reckoned there was still plenty of money left to milk from the Spectrum and set his Amstrad

techies about producing an improved version.

One such techie was Richard Altwasser, who designed the hardware for the original ZX Spectrum at Sinclair, before leaving in 1982 to develop the Jupiter Ace with Spectrum veteran Steve Vickers. When Jupiter went bust in 1984, Altwasser joined a technical consultancy firm and was later head-hunted by Amstrad. He was appointed in January 1986 and soon joined Amstrad as Engineering Manager.

Altwasser's recruitment had been unrelated to the Sinclair purchase, but the timing proved fortuitous, joining as the ink dried on the buy-out. Altwasser recalls being asked into the office of Amstrad's manufacturing director Bob Watkins on his first day to look over some circuit diagrams and being surprised to see they were of the Spectrum, drawn and signed by himself some years before.

Almost inevitably, given the company's history, Amstrad's first enhancement for the new Spectrum would be a built-in tape deck. Amstrad also added joystick ports and a proper keyboard and set about improving Sinclair's infamous reliability issues. Altwasser

began re-engineering the hardware and setting up new production lines in Taiwan.

While the new Spectrum would be compatible with software for previous models, it still needed a certain amount of modification. Following the Sinclair purchase, a large box of Vax tapes and crates of paperwork turned up at Amstrad's Brentwood HQ, and the project team realised they'd need someone who'd previously worked at Sinclair to make sense of it. They hired Rupert Goodwins who'd joined Sinclair in the autumn of 1985 and written much of the software for the UK Spectrum 128. Goodwins joined existing Amstrad employees Cliff Lawson and Vik Olliver to work on the new machine's software. Graham Webber was responsible for the industrial design.

The new Spectrum +2 was launched in early 1987 and, crucially, Amstrad adopted an entirely different marketing strategy to Sinclair. While Sir Clive strongly sold his Spectrum as a proper computer with proper computing capabilities, Sugar knew the Spectrum's success was as a gaming machine.

Despite the growing 16bit market, Sugar believed there was life left in 8bit and ordered a second Amstrad Spectrum to be

produced. Like Amstrad's CPC line, the natural evolution meant the new Spectrum +3 would be equipped with a floppy drive and, again like the CPC-6128 and PCW, it would be a 3in model. This time, the internal PCB was redesigned with a reduced chip-count and work was split between Altwasser and Steve Gane. The software was again written by Goodwins, Lawson and Olliver, now with additional input from Locomotive for the disk-operating system.

The Spectrum +3 launched in 1988 for £250, followed shortly afterwards by the +2A, a tape-based version using the +3 PCB in a black case. By this time, however, the 8bit Spectrum couldn't compete with the 16bit Atari ST and Commodore Amiga. The +3/+2A would be Amstrad's last Spectrums.

Sugar's strategy had paid off, though. He believed he could get a return on his investment in just one Christmas season and, after doing so handsomely, he went on to cream additional profits from the Spectrum over its final lifespan. Many people may have had their first taste of programming on a Spectrum, but Sugar knew the real money was in selling it as a games machine.

Gordon Laing

With thanks to Sir Clive Sinclair, Richard Altwasser, Rupert Goodwins, Cliff Lawson, Vik Olliver and Chris Owen's Planet Sinclair website at www.nvg.ntnu.no/sinclair.

July Cover Disc

Six pages of workshops, special offers and more >>

On the CD

Stuffit Standard 9

Acronis Privacy Expert Suite Personal 8

Paragon Partition Undelete

Paragon Encrypted Disk 2

Panda Truprevent Personal 2005



Using the cover disc

The PCW cover disc uses a web-browser-style interface. To get full functionality, you'll need to use Microsoft Internet Explorer (version 5.5 or later). Unfortunately, Netscape doesn't properly support this software. However, we have also provided links to the featured programs so that you can still copy them to your hard disk or install them manually (the standard download dialogue box will appear). Programs can be found in the \software\ folder on the disc.

Starting the disc

The CD-Rom (or DVD) should auto-start. If it doesn't, double-click the CD-Rom/DVD icon in My Computer, or open the terms.htm file on the root of the disc.

Problems?

Please note that we cannot give support on individual programs contained on this disc.

If you have problems running the disc or any of its content, please note these guidelines:

FAULTY DISC > If the disc is physically damaged and will not load, return it to this address for a replacement:

PCW July 2005 cover disc

ABT, 306 St Mary's Lane
Upminster, Essex RM14 3HL

quoting reference 'PCW Vol 28 No 7'.

PROBLEMS INSTALLING/RUNNING THE SOFTWARE >

Check the support page on the disc, or check the manufacturer's site.

GENERAL DIFFICULTIES > Call 08700 885 995 (9.30am to 5pm Mon, Tues, Thurs & Fri; open until 8pm on Wed and 10am to 2pm Sat). Or go to www.vnusupport.co.uk or email us at pcw@vnusupport.co.uk.

On the DVD

Serif Drawplus 5

Mandriva Linux 2005

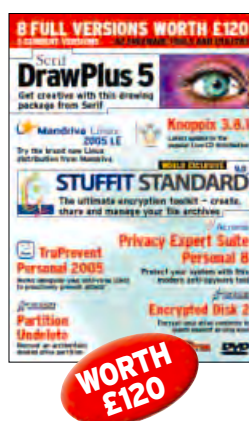
Stuffit Standard 9

Acronis Privacy Expert Suite Personal 8

Paragon Partition Undelete

Paragon Encrypted Disk 2

Panda Truprevent Personal 2005



SOFTWARE LISTING

CD

Full versions

Stuffit Standard 9
Acronis Privacy Expert Suite Personal 8
Paragon Partition Undelete
Paragon Encrypted Disk 2
Panda Truprevent Personal 2005

Trial versions

Acronis PrivacySuite 8
Canvas X
O&O Defrag V8
Paragon Partition Manager 6
Ulead DVD Movie Factory 4

Buyer's guide ebooks

PCW's invaluable guides to all you need to know when buying camcorders, cameras, graphics cards, hard drives, monitors, motherboards, printers, processors, audio devices and TV tuners

From the magazine

DivX 5.2.1
GSpot 2.21
PDFill Form Filler 3
PHP Nuke 7.5
Xvid 1.03
Yabb 1.4

Freeware including

CLCL 1.1.2
ContentSpring 1.1
FireTune 1
UK Kalender 1.3.0

Resources including

Adobe Reader 7
Google Desktop Search
MSN Messenger 7
Zipgenius 6.0.1.1010
Zonealarm 5.5.062

DVD

Everything on the CD PLUS...

Full versions

Serif Drawplus 5
Linux and open source
Mandriva Linux 2005
Limited-Edition
Knoppix 3.8.1

Trial versions/resources

Ulead VideoStudio 9
Openoffice v2 beta

Games

Imperial Glory
Robots
Trackmania Sunrise



Stuffit Standard 9

**FULL
VERSION**



Need to know

System requirements

64MB of Ram, Windows 98SE/ME/2000/XP,
30MB of free hard disk space

Information

www.stuffit.com

Registration

Visit www.allume.com/cgi-bin/freeallume.cgi?stuffit-pcwjuly and quote the magazine code **PCWSTD9**

Limitations

None

An archiving program with lots of benefits

After eight previous versions and a history stretching back to 1986, you might think the Stuffit developers would run out of ideas for their market-leading archive tool. But version 9 includes new features to take this program even further ahead of the competition.

You can now compress your digital photo collection with no loss of quality. And, while Zip files would save you less than one per cent of space, Stuffit's own Stuffit X format can reduce the file size by up to 30 per cent, especially useful when compressing jpg files. This would quickly translate into real savings in bandwidth or disc space and means you can archive files with fewer discs.

Previously it was inconvenient to hide your images away in an archive, but Stuffit can include thumbnails within an image

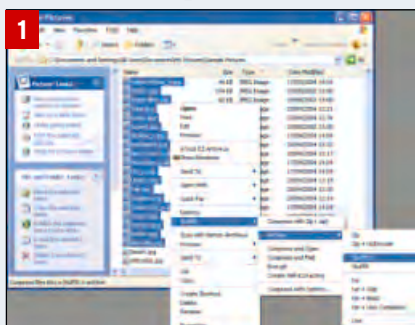
archive, so you can browse it without having to extract every file. There's even an option to build redundancy into the file; extra blocks of information that could allow corrupt files to be automatically repaired.

Whatever type of file you're compressing, security has been improved with a Whole Archive Encryption feature. Choose your algorithm from the selection (up to RC4 512bit) and the resulting archive is made read-only and can only be viewed by someone who knows the password.

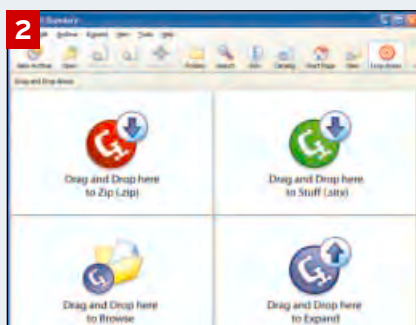
There's also easy integration with your anti-virus tool, better compression and decompression speeds and an improved interface.

It's the best version of Stuffit ever and if you need more than basic Zip functionality it's well worth giving it a try.

Three ways to work with Stuffit Standard



1 Everyone has their own way of working with archive files, so Stuffit Standard has developed several different options. One way is to work directly from Explorer; select some files, right-click and choose the options you need from the Stuffit context menu.



2 Here's an even easier approach. Start by launching Stuffit Standard, click 'Drop Areas' on the toolbar. Now drag and drop any selected files to create or expand an archive. The program handles everything automatically, with no intervention required.



3 If you need a little more power, turn to the Stuffit Standard wizards. Here you can expand or create an archive with full control over every aspect of the process. There are even wizards to upload your archives to an FTP server or send them by email when you're done.

Upgrade offer >> Stuffit Deluxe

New features

- >> Microsoft Office integration
- >> Scheduler
- >> Build sea files
- >> Automate compression tasks
- >> Build searchable index

If you need even more archiving power, Stuffit Deluxe includes extras such as Microsoft Office integration and a scheduler that turns the program into a full-featured backup tool. Bonus applications include Sea Builder for creating custom self-extracting archives, Express to automate almost



any compression task and Disk Index which builds a searchable index of your backup CDs and DVDs.

Usually priced at \$39.99, you can upgrade for only \$14.99 (£8 approx). Place your order at the Stuffit store (www.stuffit.com).

Privacy Expert Personal 8



Need to know

System requirements

Windows 98 or later, 6MB of disk space

Information

www.acronis.com

Registration

Go to www.acronis.com/mag/vnu-privacysuite and follow the instructions

Limitations

None

Acronis' suite detects and removes spyware

Spyware is an increasing menace, common on even the best-protected corporate PCs. So it pays to run a specialist spyware detector along with your anti-virus program. And choosing Acronis Privacy Expert Suite makes a lot of sense.

The speedy scanning engine offers much in the way of configuration. The setup options allow you to either look for spyware with a Smart Scan (a quick search of known spyware locations only) or a Deep Scan (checking the drives or folders you specify). The program won't abuse your bandwidth either, by checking for spyware definitions every five minutes. Instead you can schedule an update time and frequency, perhaps running it overnight when you're not working on your computer.

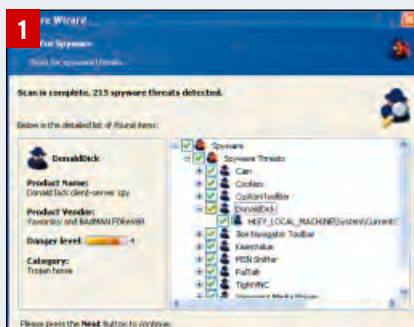
Once configured, you can run Privacy Expert Suite, scan your PC for spyware and remove any threats it has discovered. A scheduler allows your PC to be automatically checked every day.

The real bonus is Spyware Shield, a feature that constantly monitors your PC and aims to block any attempted spyware installations as they happen.

There are options to prevent browser hijacking, stop malicious programs installing themselves and starting when Windows loads and a module to prevent new ActiveX components being installed without your permission.

Add a fourth check that stops known spyware processes from running in the first place, and Privacy Expert Suite offers one of the most complete anti-spyware solutions.

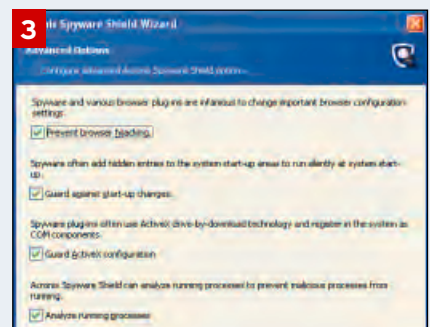
The complete solution for eliminating spyware



1 Once you've installed Privacy Expert Suite, click 'Spyware Removal' and let the program scan your memory and drive (this may take a while). When it's finished you can review any threats that have been discovered and opt to remove them (or not) by toggling the green checkbox.



2 Once any current infections have been removed, you can block future spyware installations as they happen with Spyware Shield. Click on the program and enable the real-time protection (if you didn't do so during installation), perhaps loading it when your PC starts.



3 Click Next, and opt to be warned for 'All suspicious activity' (secure but no false alarms), or 'Known threats only' (fewer dialogues, but less safe). Click Next and decide what you want monitored: browser, Startup programs, ActiveX components or running processes.

Upgrade offer >> Privacy Expert Suite 8

New features

- >> Clear your Internet browser tracks
- >> Clear traces left by Windows and other common applications
- >> Securely erase files
- >> Block pop-ups

Privacy Expert Suite Personal is a full application, with a subset of the features in the commercial version. If you upgrade to the commercial version you'll have access to tools to clear your Internet browser tracks, and the traces left behind by Windows or a host



of other common applications. Other modules securely erase files from your hard drive, block pop-ups and more. Point your browser at www.acronis.com/homecomputing/sales/upgrade to upgrade for only \$19.99 (£11 approx).



Paragon Partition Undelete

**FULL
VERSION**

Need to know

System requirements

Windows 98 or later, 10MB of free disk space

Information

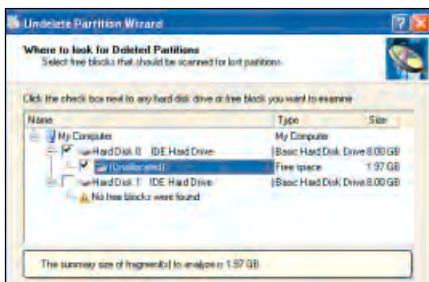
www.paragon.ag

Registration

Follow the link during installation, register your details and Paragon will email you a serial code

Limitations

None



Pick the drive with your missing partition, and Partition Undelete will search every sector to track it down

Hard drives rarely fail these days, but there are plenty of other ways you can lose your valuable data. A single byte change in the partition table, for instance, either by accident or caused by a virus or Trojan, can mean one of your drive partitions will disappear completely.

However, Paragon Partition Undelete could recover your files quickly, even if you're a partition management novice.

The process starts once you've launched Partition Undelete and chosen where you'd like to search. Pick a drive with no unpartitioned space – this way you can't go any further and inadvertently damage a working partition table.

If you choose the problem drive, though, Partition Undelete will scan it sector by sector, looking for the file system of your missing partition.

Anything discovered is presented for your approval, and if you say it's correct, Partition Undelete will rewrite the partition table entry for you.

The program can't solve every problem, though and it may not help if it is your partition that has been damaged, rather than just the partition table entry.

Still, it's well worth including this in your data recovery toolkit as extra insurance against potential disasters.

Save cash >> On Paragon products

Paragon offers a wide range of system utilities, such as Partition Manager (all the functionality of Partition Undelete plus every other partition feature you'll ever need), Drive Backup (disk imaging with an incremental backup option), Hard Disk Manager, CD-Rom emulator and more.

Prices start at \$29.95 (£16 approx), and now you can benefit from 30 per cent off the recommended price.

Visit www.paragon.ag to read more about each product and enter coupon code **VNUPSG** to claim your special discount.

Paragon Encrypted Disk 2

**FULL
VERSION**

Need to know

System requirements

Windows 98 or later, 64MB of Ram, 12MB of free disk space

Information

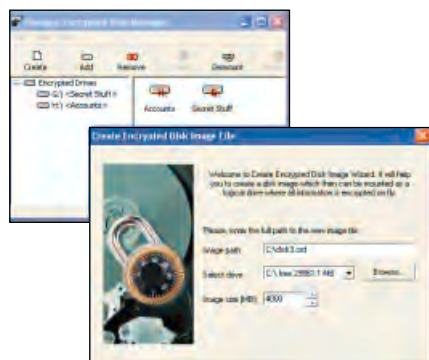
www.paragon.ag

Registration

Not required

Limitations

None



Create multiple virtual encrypted drives to hold different types of file

Most PCs hold at least some information you wouldn't like to share with the world, such as financial information, work reports, emails, user names and passwords. While it might be safe now, if your system is stolen (or you just take it in for repair) there's no way to tell who might gain access to your information.

Encryption is the way to keep your confidential data safe and a simple way to use it is through Paragon Encrypted Disk. Launch the Disk Manager, click Create and work your way through the wizard, to create a virtual drive encrypted with a key size of up to 448bits.

It allocates a drive letter after formatting and then you're done.

Once created, the new Paragon drive works just like any other. You can drag and drop private files from Explorer, for instance, or save them directly from other applications as required. But there's a difference. Once you close it from the Encrypted Disk Manager this drive will disappear, leaving no visible sign that the files it contains even exist. Only someone who knows the password (or holds the key you create on removable media) will be able to access them again, keeping your private data safe from even the most expert of snoopers.

Save cash >> On Paragon products

Paragon offers a wide range of system utilities, such as Hard Disk Manager (partition management, backup and more), CD-Rom Emulator (get up to 23 virtual CD or DVD drives and avoid disk swapping), Partition Manager, Drive Backup and more. Prices start at

\$29.95 (£16 approx), and now you can benefit from 30 per cent off the recommended price.

Visit www.paragon.ag to read more about each product and enter coupon code **VNUPSG** to claim your special discount.

Panda Truprevent Personal


**FULL
VERSION**

Catch viruses before they damage your data

Need to know

System requirements

Windows 98/ME/2000 Pro/XP, 96MB of Ram, 55MB of free space (Panda Software anti-virus solutions include Truprevent, so if you have any of these installed, this version of Truprevent will not work)

Information

www.pandasoftware.co.uk

Registration

Follow the instructions after installation

Limitations

Your upgrade licence will expire after six months

Most anti-virus companies love to boast about their speedy reactions to the latest threats, often issuing updates to protect you from a new virus within 24 hours of discovery. Sounds impressive, until you realise that more than a million PCs could be infected within that time and for those unlucky users the upgrade will be too late.

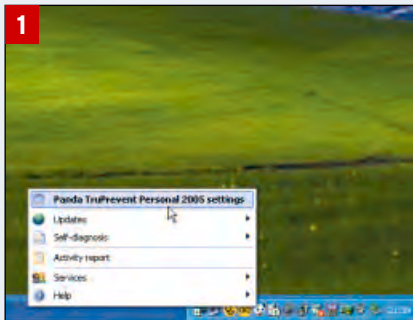
Panda Truprevent Personal 2005 offers another layer of protection. It's designed to look for and block suspicious behaviour, rather than just detect a signature and so can trap new viruses that the competition hasn't yet discovered. It's a powerful way of protecting yourself from the fastest-spreading viruses, but of course no anti-virus tool can guarantee 100 per cent protection. So Truprevent is also backed up with a

conventional signature database, ensuring the program will detect known viruses after you've received an automatic update.

This doesn't in itself make Truprevent Personal 2005 a complete anti-virus solution, as it concentrates on scanning those programs running rather than every file. There's no attempt to scan email attachments, for instance, or downloads in an instant messaging program.

However, Truprevent is not intended to be a replacement for your existing anti-virus tool, but should run alongside it, so doesn't need all the same functionality. Dropping some of the file scanning helps avoid conflicts and keeps the program light on resources, while still giving you a fresh chance at detecting new threats and a second opinion on known viruses.

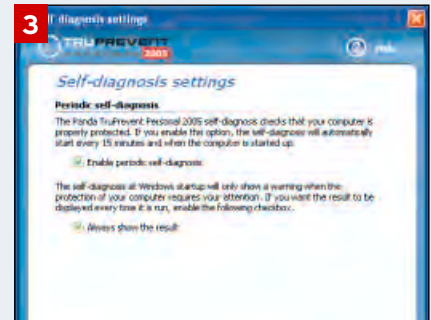
Anti-virus protection made easy



1 By only scanning programs as they run, Truprevent avoids the complications of your regular anti-virus program. There's no system scan option, script blocking to set up or complicated rules to configure, for instance. Right-click on the Panda system tray icon for a few useful features.



2 If Truprevent Personal 2005 detects an unknown virus it will block the suspect program from running. Right-click on the system tray icon, select Truprevent Personal 2005 Settings > List of blocked viruses > Send to Panda, and the company will analyse the threat.



3 Trojans, worms and other threats often try to disable anti-virus programs, so to detect this, choose Self Diagnosis > Self Diagnosis Settings, check 'Enable periodic self-diagnosis' and it will check when the PC starts and every 15 minutes that you're protected.

Upgrade offer >> Extend your licence

New features

>> 12 months of updates

Install this version of Truprevent Personal 2005 and you'll get updates to keep you protected for about six months before the licence expires. If you like it, why not consider upgrading?

One option is to renew your Truprevent licence for 12 months, at a cost of £12.99.



Alternatively, you can upgrade to Panda Antivirus Titanium 2005 solution (which includes Truprevent) for £16.99 for six months. Order or find out more at the Panda store.

www.pandasoftware.co.uk



Serif Drawplus 5



Vector drawing, web graphics and more

Serif is renowned for its budget software, but there's nothing low-cost or basic about this Vector drawing package. It comes with a range of powerful curve creation and node editing options, fills, textures and gradients you can add by dragging and dropping, shadow effects, transparency editing, layer features and more.

If your interest lies with web graphics, with a few clicks you can slice any image into segments and give each one its own hyperlink and pop-up text. Or you can just assign hotspots to particular regions. An Image Export Optimiser displays side-by-side previews of your work at different quality levels, so file sizes are kept to a minimum. Then Drawplus exports all the HTML you need to tie everything together.

Automatic dimension lines and scale settings features display the size your drawing represents, then dynamically adjusts it as you resize objects.

Drawplus is equally at home in creating flow diagrams, family trees or organisational charts, especially with its new Connector objects. Once you've used these to link boxes or symbols, they stay linked, even as you rearrange those boxes by dragging them around the page.

To complete the package, you get a range of handy desktop publishing templates. There are pre-built designs for greetings cards, notices, badges, stamps, watermarks and more; just click on the one you like, customise the text to suit your needs and you'll be printing the finished article in seconds.

Need to know

System requirements

Windows 98 or later, 70MB of hard disk space

Information

www.serif.com

Registration

Follow the instructions within the program

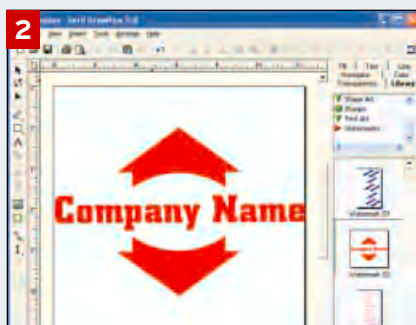
Limitations

None

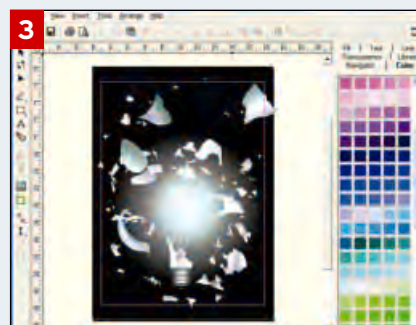
Create stylish, animated web graphics – fast



1 Drawplus has several ways to create animated gifs, starting with the straightforward Design Wizards. Click File > New > 'Use a design wizard', choose an animation, click Next, then customise it with your own text and colours. Modify the design and click File > Export to save it.



2 If you can't find a template you like, bypass the wizards and take more control of the animation. Click File > New > Create an animation, and choose a page size to begin. Drag in clipart, watermarks or text designs from the right-hand Library tab, or create something new.



3 Right-click on the 'Frame 1' tab at the bottom of the screen to add more tabs, then tweak each image to produce your animation. Open some of the bundled examples to see how sophisticated the results can be – from an animated doll figure to this exploding light bulb.

Upgrade offer >> Serif Drawplus 7

New features

- >> Feathering effects
- >> Automatic text flow round shapes
- >> CMYK colour fills
- >> Export multi-page documents to pdf

The latest version of Drawplus adds fancy new effects, such as feathering, text automatically flowing around a shape as you type, CMYK colour fills, and multi-page documents that export to pdf files with a couple of mouse clicks.



To order your copy for only £59.99 (a £20 saving off the list price), call 0800 376 7070 (or +115 9145454 from outside the UK) and quote code **RO/PCW/DP5/0505**.

Don't hang around, though, as the offer expires on 18 June 2005.





JULY 1985

Splashed across the cover of our 1985 issue was the newly released Commodore 128 – an evolutionary machine compatible with Commodore 64 software, but with twice the Ram.

Elsewhere in that issue, David Burns presented a step-by-step guide to expanding the memory of the Macintosh by four times at a fraction of the cost – Apple charged about £800, we showed you how to do it for about £280. Unfortunately, upgrading computers in those days required as much use of a soldering iron as it did a screwdriver.

In our games section, Stephen Applebaum reviewed Grand Prix from Acornsoft. Looking back, many would consider the



Commodore 128:
successor to the
Commodore 64 but with
much more memory

graphics and gameplay laughable, but we concluded the game had a stunning authenticity that would be difficult to match in the future.

Elsewhere Bob Hinton showed readers how to use Psion's Xchange suite on the QL to manage your finances. He very thoroughly showed us how to develop a system that could, among other things, warn when you were overspending. He failed, however, to mention whether he became rich as a result.



JULY 1990

July 1990's cover attempted to show exactly how the new Windows 3.0 OS was easy to use, with the strapline: 'Child's play'. Guy Swarbrick was impressed, and encouraged GEM users to move away and swap programs, stating: 'everything that program can do, Windows 3 can do better'. It provided increased speed and the ability to multi-task both Windows and DOS applications. We stated that it might even be the program to 'make OS/2 a success at last'.

We also took a look at some alternatives to super-fast 286 systems. Dell's 320LX and the lesser-known Mitac 2386E were both 20MHz machines offering fast 386SX power. Both products offered noticeable

improvements in performance over the range of SX machines at the time, but the real winner was the 320LX from Dell, which was 'solid, reliable and well-constructed'. It was cheaper than Mitac's rival, and was more suited to expansion, 'containing enough room to install a second hard disk, while the Mitac is unexpandable in this area'.

We end with a quote from Apple's Jean Louis Gasse on what he perceived the perfect computing session should be: 'It's like a rendezvous in the back seat of an automobile with a beautiful girl.' Discuss.



JULY 1995

Pentium notebooks made the cover of our July 1995 issue. We took an in-depth look at six of the latest all-singing, all-dancing models, with the NEC entry scooping the top award. Featuring an 800 x 600 SVGA screen, 810MB hard drive and a Pentium processor running at 75MHz (0.075GHz in new money), the NEC model certainly impressed our reviewer Simon Rockman.

It's not uncommon for notebooks to cost a little more than their desktop counterparts, but the asking price of £5,445 seemed more than a little steep.

Quad-speed CD-Rom drives were the norm back then, but Gordon Laing was one of the lucky few to get his hands on a brand new six-speed drive from Plextor. This SCSI model was available in both external and internal flavours, but despite the retail price of £420, no SCSI card was included in the package. Nevertheless, the Plextor drive was, without a doubt, the fastest CD-Rom we'd ever seen.

Also to be found in this issue was a round-up of the latest web browsers. A grand total of seven browsers featured, namely Mosaic, Cello, Netscape, Internet Works, Winweb, Spry Air Mosaic and Quarterdeck Mosaic. With the number of people's homes connecting to the Internet rapidly increasing, deciding which software to use to access the world wide web was a big issue.

Sadly, only two of these browsers are still around today. Netscape is the obvious one, with Internet Explorer being the second – IE 1 was actually developed using the original Mosaic code.



JULY 2000

The Love Bug virus was still causing widespread panic when the July 2000 issue hit the shelves, with many experts fearing a copycat attack.

Released on 5 May 2000, the infamous Love Bug caused billions of pounds worth of damage. Linux supporters, such as Eddie Bleasdale of Net Project, were having a field day claiming the problem would never have occurred had the world's population been running off Linux-based computers.

Microsoft was making a lot of noise about its new operating system, Windows Millennium Edition. Promising rapid booting, better support for home networking and imaging features, demand for this new version of Windows was high. Sadly, especially for the early adopters, Windows ME was soon superseded by Windows XP.

With broadband Internet access rapidly becoming a reality for UK homes, adequate protection against attack was a new concept to migrating dial-up users. BT increased concern by declaring it would not be shipping firewalls as standard with its ADSL connections. Thankfully, several manufacturers were already releasing software and hardware firewalls to combat the problem.

Meanwhile, the hype surrounding Wireless Application Protocol (Wap) mobile phones was spiralling out of control. Expectations were wildly out of step with what would actually be possible with a 14.4Kbits/sec connection. But despite concerns surrounding Wap, the fact that it's still present in the majority of today's mobile phones says a lot.

The PCW team